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September 13, 2024

Via email: satelliteplanning-planificationsatellite@ised-isde.gc.ca.

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**Re: Canada Gazette, SMSE-006-24: Consultation on a Policy, Licensing and
Technical Framework for Supplemental Mobile Coverage by Satellite**

Ms. Scott,

Rogers Communications Canada Inc. (Rogers) is pleased to provide Innovation, Science and Economic Development Canada (ISED) with the following comments in response to SMSE-006-24: *Consultation on a Policy, Licensing and Technical Framework for Supplemental Mobile Coverage by Satellite* (the Consultation), published in the Canada Gazette, Part I, June 29, 2024.

Rogers thanks the Department for the opportunity to provide input on this important issue.

Sincerely,

A handwritten signature in black ink, appearing to read 'Howard Slawner', written in a cursive style.

Howard Slawner
Vice President - Telecom
HS/pg

Attach.

Consultation on a Policy, Licensing and
Technical Framework for Supplemental Mobile
Coverage by Satellite
SMSE-006-24

Comments of
Rogers Communications Canada Inc.
September 13, 2024



Executive Summary

- E1. Rogers supports Innovation, Science and Economic Development Canada's (ISED or the Department) effort to introduce a framework to enable Supplemental Mobile Coverage by Satellite (SMCS) services in Canada. Since our initial announcements in Spring 2023 of partnerships with Lynk Global Inc (Lynk) and Space Exploration Technologies Corporation (SpaceX), our goal has been to bring satellite-to-mobile (also known as direct-to-cell) coverage nation-wide to ensure Canadians stay connected in areas beyond the limits of traditional terrestrial wireless networks. We plan to start with satellite coverage for texting and will then add voice and data across the country's most remote wilderness regions, national parks, Indigenous communities, and rural highways that are unconnected today. Further, as Canada's national wireless telecommunications company, Rogers remains committed to helping **all Canadians** – regardless of their wireless service provider – reach assistance and 9-1-1 across Canada as soon as voice emergency support is enabled via satellite access.
- E2. Rogers' planned SMCS services will thus directly contribute to the policy objectives of the Government of Canada as set out in this consultation, namely: expanding mobile services particularly in unserved and underserved areas, including rural, remote, and Indigenous communities; promoting competition in the provision of wireless services so that consumers and businesses benefit from greater choice and competitive prices; supporting increased reliability and resiliency of telecommunications services; and, fostering investment and the evolution of wireless networks by enabling the development of innovative and emerging applications. From underground transit systems in Canada's largest cities, to cell towers in space covering Northern communities, Rogers is leading the effort to bring Canadians the largest and most advanced wireless networks across the country, in order to keep them connected and safe.
- E3. At the same time, Rogers and our satellite partners are not the only ones looking to launch SMCS services. Several Canadian wireless operators are currently working with established international satellite operators, that in turn have partnerships with leading mobile network operators from around the globe. SMCS is already a highly dynamic and competitive space, albeit in a critical start-up phase. While the Department is to be applauded for seizing the moment and working to establish a framework by April 2025 to authorize SMCS deployments within Canada, it must take care to allow for natural technological and market developments. As such, the Department should not adopt any mandatory roaming requirements. There are viable satellite options and opportunities for all Canadian wireless carriers, from across the country and of every size.

- E4. Indeed, the Department itself identifies that such measures may not be necessary, with the Consultation stating that as SMCS is a new and emerging technology and, as the SMCS market and technology are in an early stage of development, it may not be practical to apply mandatory roaming as a condition of licence. The Consultation also highlights that, to-date, roaming has only been considered on terrestrial mobile networks, not on any Mobile Satellite Service. As SMCS deployments are likely to require bespoke integration solutions depending on mobile network technology stacks, particularly in the early, pre-standardization rollout phases, any forced integration of flexible use licensees will delay the deployment of any SMCS services for all Canadians. Most standard mobile phones will be SMCS-capable for emergency 9-1-1 voice services, when deployed by SMCS operators, regardless of a customer's wireless service provider but additional commercial usage will require some sort of Over-The-Air optimization from the mobile operator, further complicating potential roaming. Consideration must also be given to how much capacity a single satellite operator will have to serve all the customers of multiple national and regional roamers and the ability to address the requirements for upgraded functionality in devices to enable SMCS capability. In truly remote areas of the country, this may have fewer but still material impacts. For coverage just outside of terrestrial mobile networks, the impact could be significant and potentially debilitating.
- E5. It is important to highlight that SMCS services will not be restricted to a single mobile network, nor a single satellite operator. Three mobile operators have already publicly announced technology trials or have established a relationship with one of the leading SMCS satellite providers. Other relationships may be underway that have yet to be announced. It is important for the Department to foster these initiatives and assist bringing these new life saving technologies to market, especially in light of all the efforts to launch similar services around the globe. Canada is not the only country looking to launch SMCS-type services and an overly restrictive regulatory regime could encourage the satellite providers to focus on jurisdictions with less onerous regulatory frameworks in order to speed their time to market.
- E6. For these reasons, the Department should not prohibit exclusivity. At this early, pivotal stage of SMCS, it is essential that wireless carriers undertaking these extraordinary initiatives and risking large amounts of capital, can make the necessary partnerships to justify such investments. Fostering such relationships to develop the necessary technology is key to delivering these advanced services in the very near future. Such arrangements will not harm competition as: 1) multiple carriers are already working with multiple satellite providers; and 2) the satellite

providers have been very publicly clear of their intention to ultimately provide service to as many carriers as possible. Nor will public safety be jeopardized as 9-1-1 will be made available to every carrier's subscribers. As such, carriers should remain allowed to enter into, or at the very least maintain, exclusive arrangements in order to help develop and deploy these new services as quickly as possible.

- E7. Rogers is committed to the public safety of all Canadians, regardless of their wireless service provider and without a mandatory roaming requirement. Any perceived benefits of such regulatory measures are thus unnecessary and do not outweigh the significant actual harms to SMCS deployments they would have. We continue to explore options to support connecting all Canadians to emergency services as soon as technically feasible for all stakeholders. 9-1-1 services will require SMCS to have voice telephony enabled, and developmental work and testing is required to ensure successful integration. Rogers and other industry stakeholders are already actively involved in this work within the appropriate technical forums at the Canadian Radio-television and Telecommunications Commission (CRTC).
- E8. We are generally supportive of the proposed initial commercial mobile bands to be made eligible for SMCS services, including the 600 MHz, 700 MHz, 800 MHz Cellular, PCS, AWS-1, and AWS-3 bands. However, the Department should maintain its technology-neutral approach and allow for an SMCS designation for all commercial mobile bands unless there is a specific technical reason for excluding a band that cannot be mitigated through technical means and standard operating regulations. This includes all Time Division Duplex commercial mobile bands.
- E9. In addition, the Department should add an SMCS designation to the 700 MHz Public Safety band (Band 14) now, even if it ultimately determines to not license the band for SMCS services at this time. Taking all steps required to make the 700 MHz Public Safety band SMCS-enabled at this time will facilitate faster Public Safety SMCS rollouts in the future once a decision has been made regarding a Canadian Public Safety Broadband Network. The sooner that the Department can add the 700 MHz Public Safety band to the list of SMCS-eligible bands, the sooner that satellite operators and handset vendors can build the capability into their spacecraft and devices and Internet of Things (IoT) modules. Enabling SMCS for the Canadian 700 MHz Public Safety band would also fully align with the decision by the U.S. Federal Communications Commission to add a Supplemental Coverage from Space designation (the U.S.'s SMCS equivalent) to the U.S. Public Safety 700 MHz spectrum, all of which would be a huge benefit to the first responder community.

- E10. Rogers is generally supportive of the regulatory approach that the Department is proposing to enable SMCS services within Canada's spectrum policy frameworks and the Canadian Table of Frequency Allocations. We agree that SMCS should be a secondary service and must protect primary mobile and adjacent services, while successfully coexisting with existing secondary services. However, the Department should take care that it does not impose unnecessary restrictions or onerous technical measures based on spurious claims by competing satellite services or flexible use licensees that are seeking to delay competitors from coming to market first. Canadians will benefit from the coverage expansion of SMCS services, and they should not be unduly delayed or constrained.
- E11. Rogers recommends that the Department generally align with equivalent U.S. hardware requirements for both devices and base stations. Any operational limitations specific for terrestrial systems should be dismissed for installations in space. Since many satellite stations could be operating over the U.S. prior to transiting into Canada, all Canadian hardware specifications should be fully aligned with U.S. standards. For certainty, Rogers agrees with applying current Canadian power flux density limits (PFD) from existing Canadian technical regulations (and as proposed in the Consultation), since the protection of user equipment is common to both terrestrial and satellite cases. This may not necessarily align with U.S. values, which in some cases could be less stringent. While adopting current Canadian PFD limits, the Department should maintain its practice of allowing operators to mutually agree upon alternate thresholds, thereby providing both cross-boundary protection when needed, as well as full flexibility to enable coordinated continuity of service. Further, SMCS is highly dynamic and in an early developmental phase, and current analysis may not have incorporated all advancements. The Department should ensure technical regulations retain flexibility if any changes or guidelines are produced, and look to real-world measurements as these systems come online.
- E12. Finally, the Department should count SMCS coverage towards mobile coverage requirements and protect exclusively licensed terrestrial SMCS spectrum from the Access Licensing regime. The Department is proposing April 1, 2025 for the SMCS Framework to come into force, with a provision to allow commercial service prior to the Framework launch. Flexible use licensees will be using SMCS to provide coverage in deep rural and remote areas (to start) but Canadians could lose actual connectivity, as well SMCS IoT services used for disaster recovery, environmental and infrastructure monitoring, and remote industries (e.g., agriculture, natural resource extraction, transportation, etc.) if the spectrum is considered "not deployed" or if holes in spectrum coverage are created to provide small operators with access to already assigned exclusively licensed spectrum. ISED must assess

access licensing requests holistically, fully considering all possible types of usages, terrestrial and space, for every band. The Department should work with primary licensees to ensure that the Access Licensing regime does not result in SMCS coverage holes that could unintentionally create “dead zones” with impacts up to 150km or more per “hole”.

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Introduction

1. Rogers Communications Canada Inc. (Rogers) is pleased to provide Innovation, Science and Economic Development Canada with the following comments in response to *SMSE-006-24: Consultation on a Policy, Licensing and Technical Framework for Supplemental Mobile Coverage by Satellite*¹ (the Consultation), published in the Canada Gazette, Part I, June 29, 2024.
2. As Canada's largest single national network operator with a proud history of bringing technological innovations to all Canadians, Rogers is poised to launch Canada-wide satellite-to-mobile coverage that will enable access across Canada's entire landmass using standard mobile phones. This service will benefit all Canadians no matter where they live, work, or play, while particularly benefiting those living in rural and remote areas outside of traditional terrestrial coverage, including remote Indigenous communities. The service will start with texting and over time will expand to include voice and data to help all Canadians reach 9-1-1 with 4G and then 5G smartphones. Rogers strongly supports the Department's efforts to establish a Supplemental Mobile Coverage by Satellite Framework and applauds the intention to have the Framework take effect on or before April 1, 2025, with a provision to consider commercial services earlier. The Government should enable service as soon as the operators are ready to serve the public, without any regulatory delay.
3. SMCS is a highly competitive and dynamic area, with multiple international satellite operators and Canadian mobile network operators already racing to launch service to the benefit of Canadians. As the Department states, the number one policy objective of the consultation is to "expand mobile services particularly in unserved and underserved areas, including rural, remote, and Indigenous communities"². The Department should not unintentionally constrain this emerging technology through the introduction of regulatory obligations that will not assist supporting real competition but, rather, will slow Canadians' ability to access SMCS services in areas of the country that are outside of terrestrial network coverage.
4. Specifically, the Department should refrain from introducing mandatory roaming obligations. At this time, it is unclear how and if an SMCS provider (earth station or satellite licensee) would be able to offer roaming services due to integration

¹ ISED, *SMSE-006-24: Consultation on a Policy, Licensing and Technical Framework for Supplemental Mobile Coverage by Satellite* (Consultation); <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/consultation-policy-licensing-and-technical-framework-supplemental-mobile-coverage-satellite>.

² ISED, *Consultation*, para 11.

architecture, device customization, or regulatory spectrum authorization, nor whether a single SMCS satellite operator has sufficient capacity to support roaming traffic. Multiple mobile operators have publicly announced partnerships and technology trials with different SMCS satellite operators. The technological and integration challenges to support standard mobile phones from “cell towers in space” requires significant specialized engineering resources, particularly on the satellite side. To layer on roaming requirements will slow technological progress during these initial development and deployment phases, which will only serve to slow the ability of Canadians to access any SMCS services. Further, as Rogers has said from our first public announcement, we intend to support 9-1-1 for all Canadians, regardless of their wireless service provider (WSP), once voice technology over satellite is available. Thus, there are no public safety considerations that would indicate any need for mandatory roaming. The Department should also ensure that any coexistence measures in the SMCS Framework or related technical regulations are not unnecessarily restrictive. No onerous coexistence measures, supported only by operators or services looking to slow the deployment of SMCS services for Canadians, should be imposed.

5. With the recent advances of satellite technology, particularly growing constellations of satellites in low earth orbit (LEO), and the ability to enable connectivity between LEO satellites and standard 4G and 5G mobile phones, there has never been a better opportunity to deliver wireless service to every Canadian, no matter where they are located. Rogers seeks to add satellite-to-mobile coverage beginning in the near future across Canada’s most remote regions, national parks, and rural highways not covered by any wireless networks, including remote Indigenous communities. The service will start with texting and over time will expand to include voice and data to help all Canadians reach 9-1-1 with 4G and 5G smartphones. This service will involve LEO satellites from two separate providers, Space Exploration Technologies Corporation’s (SpaceX) Starlink constellation and satellites from Lynk Global Inc. (Lynk), combined with multiple Rogers’ national wireless spectrum bands.
6. Canadian terrestrial mobile network operators have invested billions of dollars in spectrum and network infrastructure over the decades to continue expanding and enhancing terrestrial coverage in rural and remote areas. The overall strength and resilience of Canada’s wireless (and wireline) facilities-based networks in light of the COVID-19 pandemic have been a point of pride for Canada. While the pandemic highlighted that Canadians living in some rural and remote areas do not have the same connectivity options (which governments and industry are working together to resolve), broadly speaking, nearly all Canadians currently have access

to world-class mobile voice and broadband data services due to the facilities-based competition among network operators.

7. Indeed, as the CRTC states in their *Communications Market Reports*, 99.7% of Canadians had mobile coverage at year-end 2022, with 94.2% of First Nations reserve areas.³ The CRTC also reports that 87.7% of major roads and highways are covered. However, given Canada's vast geography, mobile service coverage gaps persist in less populated rural and Indigenous communities, and outside of major transportation corridors.
8. It is just these hard to connect areas that satellite-to-mobile will help most to provide basic connectivity, meet the CRTC and government of Canada's mobile wireless network availability targets, and expand wireless coverage across all of Canada's vast geography to keep Canadians connected and safe. Rogers' LTE network covers 96% of the Canadian population, with our terrestrial network covering just 12% of the entire Canadian landmass.⁴ Deploying advanced wireless services to cover these last unserved populated and unpopulated areas, however, has proven to be technically and economically unfeasible.
9. Over the past 10 years alone, Rogers and Shaw have invested over \$40 billion building the world-class networks of our recently combined company. Rogers will continue to bring fast, reliable networks to more communities over the next five years by: investing \$1 billion to connect rural, remote, and Indigenous communities and unserved remote highways in the four Western provinces; investing \$2.5 billion to expand and improve 5G in over 300 communities in Western Canada, including 40 new communities, totalling 140,000 square kms of coverage; and, investing \$3 billion in broadband to provide faster speeds to 4.7 million homes from Northern Ontario through to British Columbia. These Western-specific investments will be on top of our continuing investments across the rest of Canada, such as recent network expansions in rural eastern Ontario, bringing vital infrastructure to more municipalities and Indigenous communities. Through our national network investments, Rogers has Canada's largest and most reliable 5G network, which now covers over 2,300 communities.⁵ With our coming satellite-to-mobile service,

³ CRTC, *Communications Market Reports*, "Reported Mobile Coverage across Canada", accessed 02 July 2024; <https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring/mob.htm>.

⁴ LTE Pops coverage as per *Rogers 2023 Annual Report*; <https://investors.rogers.com/2023-annual-report/>. Area coverage based on internal geodata.

⁵ Largest based on total square kilometers of Rogers 5G coverage compared to published coverage of other national networks. Rogers was ranked first in the umlaut Mobile Data Performance audits in 2023-2024. For details visit www.umlaut.com/benchmarking.

we will over time cover **every community** in Canada outside our terrestrial network coverage, including Indigenous communities, provided we maintain access to the spectrum needed to deliver this service to Canadians.

10. We note that portions of the 800 MHz (Cellular) and the 1900 MHz Personal Communications Services (PCS) spectrum bands will be made available through the Access Spectrum Licensing (ASL) Framework, bands that will be the pioneer bands for the new SMCS service. We encourage the Department to continue working closely with Cellular and PCS licensees to ensure that any spectrum that is ultimately made available for the ASL regime is, in fact, not currently deployed by primary licensees nor soon to be deployed via satellites, which could derail deployment and timely availability of connectivity services in rural and remote areas across the country. The Department should ensure that their goal of providing small WSPs and wireless Internet service providers (WISPs) with spectrum access does not jeopardize Canadians' ability to get actual service from mobile or SMCS networks.
11. Facilities-based leaders like Rogers continue to make the significant investments required to maintain and grow network infrastructure that enables Canadians to fully participate in the digital economy. In 2021 and 2023, Canadian mobile carriers spent \$11.1 billion on 3500 MHz and 3800 MHz flexible spectrum, with Rogers alone investing \$3.8 billion.⁶ This investment in Canada's future positions us as the largest single investor in mid-band 5G spectrum in the country across rural, suburban, and urban markets, covering 100% of the Canadian population between 3500 MHz and 3800 MHz spectrum. According to the CRTC, telecommunications investment in both wireless and wireline networks was \$13.79 billion in 2022 for plant and equipment (\$3.79 billion for wireless alone), a combined capital intensity of 25.7% due to the requirement to maintain and upgrade extensive network infrastructure.⁷ Our 2024 capital plan will see Rogers invest a record \$4 billion to expand 5G services, connect more rural and remote communities, and invest in

Rogers, *Rogers Closes Transformative Merger with Shaw*, April 2023; <https://about.rogers.com/news-ideas/rogers-closes-transformative-merger-with-shaw/>.

Rogers, *Improved Cell Service Now Available in 21 Eastern Ontario Communities*, June 2024; <https://about.rogers.com/news-ideas/improved-cell-service-now-available-in-21-eastern-ontario-communities/>.

Rogers, *Rogers starts to expand 5G network to rest of TTC subway system*, May 2024; <https://about.rogers.com/news-ideas/rogers-starts-to-expand-5g-network-to-rest-of-ttc-subway-system/>.

⁶ Does not include 2024 Residual Auction, nor account for inflation. ISED, *3500 MHz Auction — Final Results*; <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/spectrum-allocation/auctions/auction-spectrum-licences-3500-mhz-band/3500-mhz-auction-final-results>.

ISED, *3800 MHz Auction — Final Results*; <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/spectrum-allocation/3800-mhz-auction-provisional-results>.

⁷ CRTC, *Communications Market Reports, Data – Telecommunications sector*.

next generation Internet and home entertainment services after investing \$3.93 billion in 2023.⁸

12. These infrastructure investment numbers will only continue to grow as multiple Canadian flexible use licensees are racing to deploy advanced SMCS networks. In addition to providing Canadians with the latest technology – in both urban and rural markets – wireless industry investments in 5G networks are expected to contribute an estimated \$40 billion to the country's economy and 250,000 permanent new jobs by 2026.⁹ This contribution to the economy – in both investment and employment – will be important, as 5G will be crucial to maintaining Canada's international competitiveness. However, in order to enhance consumer experiences and meet evolving mobile usage demands, including to continue expanding network coverage and capacity in rural areas, Canadian spectrum policy must ensure that spectrum can be effectively deployed within both facilities-based terrestrial networks and coming SMCS networks.

SMCS Services

13. SMCS, also referred to as Satellite-to-Mobile (S2M), Direct to Cell (D2C) or Direct to Device (D2D), holds the promise that will allow standard smartphones to connect directly to LEO satellites in orbit over existing commercial mobile spectrum bands. Unlike traditional Mobile Satellite Services (MSS), SMCS-type services do not require specialized end-user hardware (e.g., satellite phone or specialized satellite modems), nor do they use MSS-specific spectrum to transmit to end-user devices. As the Consultation notes, attempts to integrate MSS bands into mainstream consumer handsets have been made for decades but has had limited uptake, primarily due to challenges establishing an affordable ecosystem.¹⁰ While Apple has recently launched MSS services in newer iPhones,¹¹ the service is proprietary and the availability of the service has been limited to a few high-end Apple ecosystem devices.
14. MSS services have traditionally been provided through proprietary technology satellites in geostationary orbit, approximately 35,35786 kilometres above the equator. These satellites can provide large coverage areas of continuous coverage but involve relatively long round trip transmission times. (Polar orbiting satellites can provide coverage of the poles, which geostationary satellites cannot, but do not provide continuous coverage of a specific area.) New satellite constellations

⁸ Rogers, *Rogers 2023 Annual Report*.

⁹ Accenture, *ACCELERATING 5G IN CANADA: Benefits for Cities and Rural Communities*, <https://www.accenture.com/acnmedia/PDF-112/Accenture-Accelerating-5G-in-Canada-PoV-2019.pdf>.

¹⁰ ISED, *Consultation*, para 14-15.

¹¹ Apple, *Use Emergency SOS via satellite on your iPhone*; <https://support.apple.com/en-ca/101573>.

are emerging, however, that will use frequency bands traditionally allocated to commercial mobile services to provide SMCS services in areas that have been technically and economically more difficult to reach with traditional terrestrial mobile networks. Most, though not all, of these new satellite constellations are focused on LEO satellites, operating with an altitude of 2,000 kilometres or less, significantly reducing transmission times and distances for mobile devices to send signals.

15. A number of satellite operators are partnering with mobile network operators around the world to provide SMCS services. As highlighted above, Rogers is working with Lynk and SpaceX on bringing SMCS services to Canada. Lynk has commercial contracts with dozens of mobile network operators serving 50+ countries, has successfully demonstrated service on all seven continents, and is licensed for commercial service by the Federal Communications Commission (FCC).¹² SpaceX is creating a new constellation to enable SMCS connectivity in remote regions, and has partners in the U.S. (T-Mobile), Canada (Rogers) Australia, New Zealand, Japan, Switzerland, Chile, and Peru.¹³ In addition, AST SpaceMobile has partnered with AT&T and Verizon in the U.S., American Tower, global operators Vodafone and Rakuten, along with Bell Canada.¹⁴ Terrestar Solutions Inc (Terrestar), a Canadian satellite operator, has partnered with Skylo to deliver SMCS services working with Telus, with Skylo having global mobile network partners including Deutsche Telekom and Telefonica.¹⁵
16. In addition to these SMCS satellite providers, there are several other LEO satellite vendors in various stages of constellation development and deployment, with at least one other explicitly exploring SMCS services internationally. All these other potential SMCS providers will mean even more competition, which will benefit Canadians and mobile consumers globally. However, it also means that Canada is in competition with peer jurisdictions to ensure access to emerging LEO satellite constellations and specialized engineering resources that are in high demand.
17. SMCS technology is rapidly evolving, with SMCS satellite operators generally attempting to connect 3rd Generation Partnership Project (3GPP) compatible mobile phones with their “cell tower in space” satellites. While specific technology decisions are proprietary, most providers appear focused on supporting 4th Generation Long-Term Evolution (4G LTE) or 5th Generation New Radio (5G NR) devices. The

¹² Lynk Global, *HOW WE DO IT: Direct-to-standard-mobile-phone connectivity is here*; <https://lynk.world/how-we-do-it/>.

¹³ SpaceX, *STARLINK DIRECT TO CELL*; <https://www.starlink.com/ca/business/direct-to-cell>.

¹⁴ AST SpaceMobile, *Company: Strategic Partners*, <https://ast-science.com/company/strategic-partners/>.

¹⁵ Skylo, *Partners*; <https://www.skylo.tech/partners>.

expectation is that these will be standard devices, though it is likely that Over-The-Air (OTA) updates or optimizations from a customer's WSP will be required or SMCS services may use a dedicated application (app), or updates to device firmware, at least in the early phases. It is also unclear as to the extent of commercial support for older generation devices (e.g., 3rd Generation (3G)), highly unlikely, or 2nd Generation (2G) devices). Yet it is expected that the majority of Canadians using their current handsets will be capable of accessing SMCS services once launched in partnership with their WSP.

18. Rogers recognizes the critical role that Original Equipment Manufacturers (OEMs) will play in developing optimized user equipment (UE) software to enable the reliable deployment of non-terrestrial satellite-to-mobile solutions across Canada. While we hope to utilize unmodified devices for certain SCMS services, the reality is that even basic services like text messaging may require software updates, specific customizations, and other optimizations to handle satellite-specific protocols, ensure reliable connectivity, and maintain a seamless customer experience while avoiding user confusion. Advanced use cases such as voice and data demand even more sophisticated hardware and software enhancements, including optimized antennas, power management features, and efficient handover mechanisms between terrestrial and satellite networks.
19. In addition, OEMs will need to work closely with mobile network operators to optimize software not only based on the specificities of each terrestrial network, as is already typically undertaken, but will now also need to address those of its satellite partners, creating unique solutions. These collaborative efforts will ensure seamless integration between terrestrial and satellite networks, addressing challenges arising from network variations, such as differences in spectrum holdings. These customizations will ensure high-quality, low-latency SCMS-based communications.
20. SMCS operations will connect Canadians using standard mobile devices, with some sort of optimization required for non-9-1-1 voice services, but the promise of SMCS is even greater. SMCS will enhance IoT services and provide opportunities for environmental monitoring and disaster recovery (e.g. wildfires). SMCS coverage for IoT in specific industries such as agriculture and fisheries, natural resources (e.g., forestry, mining), and transportation in rural, remote, and off-shore areas will contribute to Canada's economy and boost productivity. It will also support communities, governments, services and other public agencies better monitor remote civil infrastructure and collect environmental data, helping to make better policy decisions that benefit Canadians.

21. While SMCS satellite operators are designing their systems to work with 3GPP devices, the space systems themselves are all currently built on proprietary designs, i.e., not built to any specific current standards (though may include various individual standards). We believe that this will likely evolve over the long-term as the technology matures but that is not the case today. As such, integration and interconnection between space systems and mobile systems will require significant engineering resources and potentially novel solutions based on the specific individual space and mobile network parameters. ISED needs to allow time for these deployments to identify and work out any technical issues, economical solutions, etc., prior to any regulatory interventions and SMCS becoming a mass-market capability.

Mobile Competition Policy

22. Over the last two decades, the largest driver of wireless innovation, advanced services, and network expansion in Canada has been facilities-based competition. Rogers was first to deploy 4G LTE in Canada, which helped drive the cost per gigabyte of mobile broadband data down for all wireless subscribers while increasing speeds. We helped launch the modern smartphone era in Canada as the exclusive carrier for the Canadian launch of the Apple iPhone and were the first operator to launch Android in Canada. Rogers also launched the first and largest 5G network in Canada, powered nationally by Ericsson. Canadians in all regions currently have access to world-class mobile voice and broadband data services due to the facilities-based competition between network operators.

23. Facilities-based competition is already taking place with SMCS. As noted above, multiple Canadian mobile operators are publicly trialing SMCS services, competing to see who will be first to market for the benefit of Canadian wireless consumers. Due to the technological development and integration challenges associated with deploying such cutting-edge technology, it is only logical that SMCS satellite providers and mobile network operators are forming deep partnerships to enable SMCS services. This shows the SMCS market in the start-up phase is highly dynamic and competitive. As such, any regulatory measures that mandate commercial relationships or prohibit exclusive ones, will only serve to slow the introduction of SMCS services to the Canadian market. Dedicated associations will not harm competition as the satellite providers have clearly articulated their goal to develop multiple relationships in every jurisdiction. However, it is crucial that satellite providers and wireless carriers be allowed to foster the necessary relationships at this critical juncture to develop and deploy SMCS technology. Preventing them from doing so could delay the introduction of these new services.

24. Indeed, the Consultation recognizes how this is a sensitive point in time for satellite to mobile services. It states that as SMCS is a new and emerging technology; and,

as the SMCS market and technology are in an early stage of development, it may not be practical to apply mandatory roaming.¹⁶ This reasoning equally applies to any exclusive commercial relationships that SMCS satellite operators and flexible use licences decide to enter.

25. We again highlight that, particularly prior to the establishment and adoption of industry standards used by all mobile network and satellite operators, devices will need some sort of optimization / firmware updates unique to their own technology for general commercial connectivity. 9-1-1 capabilities, however, will still be available in the voice phase of SMCS for all Canadians, regardless of their wireless service providers.
26. Finally, SMCS satellites are unlikely to have sufficient capacity to support multiple mobile network customers, particularly more than one national operator, in all parts of Canada. In the recent *Decision on Conditions of Licence relating to the Provision of Service within the Toronto Transit Commission (TTC) Subway System* (TTC Decision), the Department acknowledged that their decisions would result in providing sub-optimal service to the Operating Licensee's own customers, as well as the customers of the Participating Licensees but it expected degraded services to be time-limited in nature and this could potentially be partially alleviated through spectrum subordinations.¹⁷ While Rogers does not agree with the TTC Decision, the Department's published justification supports taking the opposite approach with SMCS services.
27. Due to the early stage of a new space service, as opposed to the "simple" deployment of terrestrial networks underground (which had Canadian precedents in Vancouver and Montreal), it is unclear when sufficient capacity will be built into satellites to accommodate customers from multiple terrestrial operators. Further, satellite operators may not be able to accommodate additional spectrum resources from other mobile network operators even if authorized by ISED. There may also be issues surrounding what spectrum would be available from different operators based on their own terrestrial network needs and compatibility with any individual SMCS satellite provider. The end result of such regulatory intervention would not be a sub-optimal SMCS service to all customers but likely no SMCS service to any Canadians until a much, much later date. This will be especially true if satellite operators direct their engineering resources to countries with less onerous regulatory environments that promise faster times to market. Finally, it is not clear at this time which partner

¹⁶ ISED, Consultation, para 96.

¹⁷ ISED, *Decision on Conditions of Licence relating to the Provision of Service within the Toronto Transit Commission (TTC) Subway System* (TTC Decision), para 63; <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/decision-conditions-licence-relating-provision-service-within-toronto-transit-commission-ttc-subway>.

would be technically able to provide roaming services based on integration architecture, and this may be different depending on technologies deployed by mobile network or satellite operators.

28. Quite simply, a terrestrial Distributed Antenna System (DAS) of the type used in subway systems, is not the same as a tower in space, with its inherent technology and bandwidth limitations. There should be no forced access that could unintentionally result in SMCS services not working.

Emergency Services via SMCS

29. Public safety is the primary basis for the SMCS service and is what is driving our deployment of this new potentially life saving technology. The ability to connect with emergency assistance anywhere at any time will improve both public safety and peace of mind.
30. As such, Rogers' goal is to follow a roadmap to deploy the life saving potential of SMCS as the technologies are developed. From our initial announcements to bring SMCS services to Canada, Rogers has stated that the service will start with texting and over time will expand to include voice and data to help all Canadians reach 9-1-1. As discussed below in response to the Consultation questions, the initial phases of SMCS will have technological restrictions within the satellite, mobile network, and emergency services architecture, which will limit the initial availability of 9-1-1 services. In particular, Canada's current 9-1-1 service architecture is almost exclusively dedicated to voice services, which are not expected to be part of the early, initial SMCS offerings in Canada. SMCS are unlikely to ever be equal to terrestrial networks' emergency services. However, SMCS has the benefit of providing additional coverage in parts of Canada that do not currently have terrestrial coverage – much of which never will. With significant collaboration, development, and testing amongst all stakeholders, we remain confident that SMCS services will provide a complementary service to those of terrestrial 9-1-1 emergency services in due course.
31. Rogers also remains fully committed to supporting universal access 9-1-1 services to all Canadians, *regardless of their WSP*, as soon as technologically possible.
32. Wireless Public Alerting (WPA) is in a similar situation, with a number of challenges to overcome. As these are one-way transmissions that do not rely on voice connectivity, it is expected that development will have different challenges. In particular, as satellite spot beams are significantly larger than traditional terrestrial network sectors and coverage areas will vary between operators, significant work will be needed to ensure target geographic alert accuracy. Differences in LEO satellite constellation coverage (e.g., polar orbits versus non-polar) and whether the number of initial satellites is enough to provide continuous coverage over Canada

may be another potential limitation in providing WPA over SMCS in the early days. Collaboration with public safety agencies is required to ensure that the appropriate emergency alerts are being accurately sent to areas outside of traditional terrestrial public safety serving areas.

33. There are several specific technical, operational, and regulatory challenges that stakeholders will tackle to support 9-1-1 and WPA over SMCS. It should be noted that this work is already underway between Rogers and the Emergency Services Working Group (ESWG), part of the CRTC Interconnection Steering Committee (CISC), as well as through the ongoing work by SMCS satellite operators and their mobile network partners. Enabling the life saving reach and capabilities of SMCS services is one of Rogers' critical SMCS objectives.
34. SMCS will thus result in a complementary 9-1-1 service to traditional mobile, not a substitute for traditional terrestrial connectivity. It has the possibility to save lives but there will still be limitations, some of which will be overcome or reduced in the future, but some may persist because of the inherent nature of the technology.
35. The remainder of Rogers' comments respond to the specific issues raised in the Consultation.

Q1: ISED is seeking comments on the proposed considerations to identify frequency bands where the proposed SMCS framework will be applied.

36. Rogers generally supports the proposed considerations to identify frequency bands where the proposed SMCS framework will be applied, specifically: regional and/or international harmonization; stakeholder interest; benefit to Canadians, minimizing potential interference concerns; and, technology trends and potential limitations.
37. As the Consultation states, SMCS will be delivered to consumers through partnerships between mobile service providers and satellite operators. Further, both mobile providers and satellite operators continue to move towards greater regional and/or international harmonization and standards-based technologies to maximize economies of scale and enhance the development and availability of equipment ecosystems. Therefore, the strongest considerations should be to maximize the benefit to Canadians of SMCS by identifying frequency bands that peer jurisdictions are investigating.
38. The Department should ultimately ensure that the rules are consistently applied to all current and future SMCS bands. As discussed further below in Q7, the Department should update the partial co-primary MSS designation in the 800 MHz band to be secondary. In the Proposed Revisions to the Canadian Table of Frequency Allocations, 2022 Edition, ISED proposed to remove the reference to No. 5.317 from the CTFA to clearly indicate that the band 806-890 MHz is not available for MSS operations in Canada.¹⁸ Rogers' recommendation in that consultation was due to our anticipation of new SMCS services that Rogers was trialing with satellite partners. Based on the current Consultation proposals, we believe the best path forward is to harmonize secondary MSS designations to support SMCS services.
39. Rogers is aware that work is ongoing in ITU-R for IMT 2020-S and other MSS bands, and these bands need to be covered in a future consultation as soon as possible.
40. One further consideration of SMCS frequency bands is that the proposed satellite-to-mobile service operating in commercial mobile bands is different than Ancillary Terrestrial Component (ATC) services, which are terrestrial mobile applications deployed in conjunction with an MSS network operating in the various satellite

¹⁸ ISED, *Proposed Revisions to the Canadian Table of Frequency Allocations, 2022 Edition*, para 72; <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/canadian-frequency-allocations-table-and-chart/proposed-revisions-canadian-table-frequency-allocations-2022-edition/>.

spectrum bands. As ATC is essentially a terrestrial service, not a satellite service, individual base station cells will be much smaller, reducing the potential number of customers that can be served while also much more likely to be found in an urban / suburban service, with the traditional MSS service being focused on deep rural and remote areas. SMCS services are expected to, at least initially, support public safety and coverage, not necessarily high-speed data throughput. SMCS and ATC services are distinct and should continue to be treated as so by the Department.

41. Relatedly, SMCS is also not a non-terrestrial networks (NTN) solution as was defined in Release 17 of 3GPP. NTN was driven within 3GPP by licensees with ATC/MSS allocations. NTN was thus aligned to ATC licensee views and not the views of those now deploying SMCS services. While SMCS will incorporate a number of mobile communication standards, this technology is very dynamic and industry stakeholders do not need to wait for NTN standards to be fully developed and deployed. Further, SMCS deployments will not need to wait for NTN-capable handsets to be released, which are 2-3 years away from widespread availability. SMCS should be capable of starting as soon as SMCS authorizations are provided by ISED and satellites are in orbit capable of delivering service. Rogers believes that individual satellite and mobile operators may make use of them down the road if they provide material enhancements and are supported by the mobile ecosystem. In our view 3GPP NTN standards will not be deployed within initial SMCS deployments in Canada (or globally), and it will likely be at least 10-15 years before there may start to be broader convergence between SMCS and NTN. The Department should not conflate the two technology paths when developing SMCS policies or related technical regulations.

Q2: ISED is seeking comments on whether it should consider the service area size and/or the presence of mobile service providers holding the same frequency block as part of the general considerations for identifying frequency bands where the proposed SMCS framework will be applied.

42. Rogers does believe the Department should consider the service area size and/or the presence of mobile service providers holding the same frequency block as part of the general considerations for identifying frequency bands where the proposed SMCS framework will be applied. As the Consultation notes, "From what is known today, SMCS beam sizes would be between 50-100 km, which may not work with smaller service areas."¹⁹ Rogers believes SMCS beam sizes are likely 50-150 km

¹⁹ ISED, *Consultation*, para 39.

but that the technology is dynamic and rapidly evolving, so even smaller beam sizes in the future may be economically feasible. Consideration of tier service area size may be relevant for technical regulations, however Rogers does not support explicitly excluding any licensed mobile spectrum band as small as a Tier 4 level band from potential SMCS eligibility.

43. That said, the initial bands under consideration in Q5 are mostly licensed at a Tier 2 or Tier 3 level (in provinces, with Tier 4 often used for the Territories). The smallest Tier 4 spectrum licence area is 4-083 Fort Erie is still 395.86 km², with just seven (7) of 172 Tier 4 licence areas smaller than 1000 km². While service area boundaries are often irregularly shaped, even Tier 4 boundaries should be able to be coordinated with SMCS services respecting the mobile SRSP adjacent service boundary limit shared with another mobile licensee.
44. While some legacy Cellular 850 MHz and PCS 1900 MHz licences have been licensed at the TEL service level area, these licences have generally been subordinated or transferred to Bell or Telus, who operate joint regional Radio Access Networks (RAN) to create a national footprint, the “Belus network”. Furthermore, although the Consultation notes that there are few instances in Canada of mobile service providers holding the same frequency block in all areas of the country, it is substantially increased when the joint spectrum holdings of Bell and Telus are considered together, and again when factoring in spectrum held by the ex-monopoly telephone companies.
45. As Rogers and other operators have noted in previous consultation submissions, the Department should undertake efforts to fully rationalize spectrum bands and provide all operators contiguous holdings across the band. For certainty, by “rationalization” we mean that the Department should re-assign the spectrum frequencies so that all licensees’ holdings are assigned as geographically and spectrally contiguous blocks. In particular, within the SMCS context, the extended PCS band and the AWS-1 bands would benefit from rationalization and further increase mobile service providers (or joint network operators) holding the same frequency block in all areas of the country. We also recommend ISED take a similar approach in the BRS 2500 band, particularly if and when the band plan is changed to a solely time division duplex configuration.
46. While spectrum swaps can theoretically be achieved through voluntary actions, some licensees that currently have a relative competitive advantage of more contiguous spectrum vis-à-vis their competitors may favour the status quo. Such intransigent behaviour persists even if they themselves would also benefit absolutely from more contiguous spectrum for both their terrestrial networks and

the coming SMCS services. This is to say nothing of the benefit for all Canadian wireless consumers. Further, in order to maximize the efficiency of the spectrum, rationalization will often need to take into account four or five different licensees in a given licence area, multiplied over 14 Tier 2 areas and a number of smaller Tier 3, Tier 4 and TEL licence area subsets. Having the Department lead an all-licensee stakeholder process will help facilitate a relatively quick roadmap to enhancing Canadian spectrum management and, ultimately, improved service delivery for all Canadians.

47. SMCS services are amongst the most advanced wireless communications services being developed today. With their dependence on cutting-edge LEO satellites, they are, quite literally, “rocket science”. Mobile service providers that are seeking access to smaller spectrum licence areas, such as Tier 4 or 5 (or smaller), have historically not been involved in large-scale, capital-intensive innovative technologies. As a result of their small service areas and potential customer bases, they have instead sought to deploy very low-cost infrastructure, whether older generation traditional technology (e.g., 2G mobile services) or low(er)-power, licence-exempt technologies. Where these smaller operators may cause undue and unintended coverage issues will potentially be the result of licences issued under the Department’s Access Licensing regime. We encourage the Department to continue working closely with Cellular and PCS licensees to ensure that any spectrum that is ultimately made available for the Access Licensing regime is, in fact, not currently deployed by primary licensees nor soon to be deployed via satellites, which could derail deployment and timely availability of connectivity services in rural and remote areas across the country, including Indigenous communities. Access Licensing could also negatively impact primary flexible use licensees’ deployments of SMCS IoT in deep rural and remote areas outside of their traditional terrestrial networks, which could negatively impact things such as disaster recovery, environmental and infrastructure monitoring, and remote industries (e.g., agriculture, natural resource extraction, transportation, etc.).

Q3: ISED is seeking comments on the potential for the SMCS satellites to have smaller beam sizes such that they could serve smaller service areas and potentially reduce protection areas around existing mobile networks.

48. Rogers is actively working with our satellite partners to minimize potential protection zones and coordination efforts between our terrestrial mobile network and supplemental coverage from satellites. Optimizing transition zones between the coverage service areas will help provide the greatest number of Canadians with the best network experience possible, whether terrestrial or space delivered. Further, smaller beam sizes would also provide higher capacity per user. While satellite technology continues to evolve, particularly recent commercial LEO satellite technology, smaller beam sizes to service smaller areas will likely mean larger antennas and more radios. This translates into bigger payloads and higher cost for launch and orbital flight. Smaller spot beams will also tend to have higher gains, while the antenna sidelobes would not be significantly lower than the main lobe of the larger spot beam, so reduction of the protection area size may not be significant. Ultimately there will be trade offs of costs versus performance, and it is unclear in a dynamic, emerging market where the balance will ultimately land.
49. Phased array technologies will offer benefits over traditional parabolic dishes by reducing the energy transmitted into areas not specifically targeted, so there should theoretically be less interference in adjacent areas. A decrease in beam size may also be potentially accompanied by an increase in peak power from a satellite, which could also impact coexistence with other satellites. Again, further study is needed to fully understand the trade off implications.
50. Finally, Rogers is aware of ongoing work within 3GPP on the issue of beam scanning that may have implications for NTN technology, which may have an impact on connection and control data communicated to devices through cell paging. Further investigation and testing will be needed to fully understand the operational impacts to network coverage and usage of the trade offs of higher capacity (and reduced protection zones) of smaller beam sizes versus the need of devices to see the larger beam size to get network information. We again highlight that initial SMCS deployments and NTN are not the same thing, and the Department should take care to not necessarily apply NTN findings to SMCS services.

Q4: ISED is seeking comments on other considerations it should take into account when identifying frequency bands where the proposed SMCS framework will be applied.

Q5: ISED is seeking comments on its proposal to apply the SMCS framework to the following initial bands:

600 MHz (617-652 MHz/663-698 MHz)

700 MHz (698-756 MHz and 777-787 MHz)

800 MHz Cellular (824-849 MHz/869-894 MHz)

PCS (1850-1915 MHz/1930-1995 MHz)

AWS-1 (1710-1755 MHz/2110-2155 MHz)

AWS-3 (1755-1780 MHz/2155-2180 MHz)

51. Rogers generally supports the Department's proposal to initially apply the SMCS framework to the majority of commercial flexible use (mobile) bands in the frequency division duplexing (FDD) technology bands. In particular, we support the Department's inclusion of the AWS-1 and AWS-3 bands, which are not part of the initial bands of the FCC's Supplemental Coverage from Space (SCS) Framework. However, we disagree with the Department's proposal to exclude Public Safety Broadband (700 MHz) from the initial SMCS Framework, as well as the proposal to require future public consultation on adding additional commercial flexible / mobile spectrum bands, including time division duplex (TDD) technology bands. The Department should also take steps to ensure that the Access Spectrum Licensing regime does not prioritize spectrum access with actual connectivity services. We encourage the Department to continue working closely with Cellular and PCS licensees to ensure that any spectrum that is ultimately made available for the ASL regime is, in fact, not currently deployed by primary licensees nor soon to be deployed via satellites, which could derail deployment and timely availability of connectivity services in rural and remote areas across the country.

52. The Department's proposal to exclude Public Safety Broadband (700 MHz Band 14), both the D and PSBB blocks, from the initial SMCS bands will not benefit Canadians. Delaying considerations on applying SMCS to the public safety broadband spectrum until some future consultation will remove flexibility and options for Public Safety Canada and Canadian emergency services to put this spectrum to use for the benefit of Canadians. Indeed, Rogers has heard from

emergency responders and public safety officials at all levels of government and across the country about their desire to access SMCS to improve public safety. It is important to note that the sooner the Department adds the 700 MHz Public Safety band to the list of SMCS-eligible bands, the sooner satellite operators and handset vendors can build the capability into their products.

53. Including Public Safety Broadband (700 MHz) for SMCS from the outset, as was done by the FCC and the 700 MHz spectrum licensed to the First Responder Network Authority (FirstNet), would meet all the general considerations proposed under the SMCS Framework while providing Public Safety Canada with a clear roadmap to providing coverage outside of the current or future terrestrial public safety broadband network (PSBN). Having SMCS functionality built into Canadian public safety equipment as soon as possible will have immediate benefits with first responders that assist their neighbour country, while also enhancing cross-border public safety coverage. While it is possible that there could be additional considerations unique to any future Canadian PSBN and public safety SMCS service, there is no public benefit to specifically excluding Canadian Public Safety Broadband (700 MHz) from the initial SMCS Framework.
54. We note that since the launch of the Department's SMCS Consultation, Public Safety Canada has since launched a *Consultation on a Governance Framework for a Nationwide Public Safety Broadband Network*.²⁰ One of the guiding PSBN Principles is coverage, which foresees that the "PSBN will, at a minimum, have equivalent to existing commercial mobile wireless broadband coverage and should establish and/or enhance coverage in underserved urban, rural, and remote areas and Indigenous communities." The benefit of SMCS to contribute to and support Canada's future PSBN cannot be overstated. The 700 MHz Public Safety band should be immediately made SMCS-eligible, even if the Department does not intend to initially authorize SMCS services in the band.
55. We also have concerns with the Department's comments around considering any future bands for SMCS, including to Time Division Duplex (TDD) technology bands, only after being subject to further public consultation. The SMCS Framework, from the outset, should allow for additional bands, including TDD, following any review of technical regulations through the Radio Advisory Board of Canada (RABC).

²⁰ Public Safety Canada, *Discussion Paper: Consultation on a Governance Framework for a Nationwide Public Safety Broadband Network*; <https://www.canada.ca/en/services/policing/emergencies/consultation-governance-framework-psbn/discussion-paper-consultation-governance-framework-psbn.html>.

56. Although it is true that TDD technology is seldom applied in satellite communications today due to challenges resulting from high latency caused by the large round-trip delays, LEO satellites shrink the travel distances considerably compared to Mid Earth Orbit (MEO) constellations and traditional Geostationary Satellite Orbit (GSO) satellites. A further consideration is the long guard period between transmit and receive periods required to safeguard against interference due to propagation delay. Working with international partners as part of the 3GPP, an innovative TDD frame structure supporting larger transmit, receive, and guard period could be created, enabling a spectrally efficient TDD framework for SMCS.
57. TDD bands should be considered especially where there are two or more bands involved in delivering SMCS service. Carrier Aggregation allows for pairing TDD bands to deliver enhanced mobile service, whether those TDD bands are contiguous or non-contiguous. As such, TDD bands could be set up for some traffic as downlink and the uplink could be provided in another TDD (or FDD) band. Operators could manage the optimal configurations and work with vendors to achieve quasi-FDD operations using one or more TDD bands. It is also possible that a TDD band could be used in a Carrier Aggregation configuration as a quasi-Supplement Down Link (SDL).
58. Operationally, operators would also need to account for any geographic boundaries between co-channel traditional TDD and the new quasi-FDD. This could be within Canada or between Canada and the U.S. When the satellite is listening for mobiles, it receives noise from high-power tower sites located in adjacent service areas. Without mitigation efforts, this level of noise would overwhelm the satellite receiver making reception during this period unusable. In order to support coexistence, the quasi-FDD would be required to be synchronized with the TDD system, so the satellite is not listening when the towers are transmitting. This would likely require an international cross-border agreement on TDD frame structures and the quasi-FDD channel would be restricted to one portion of the TDD duty-cycle. This may not maximize spectral efficiency, so further study is required to fully understand potential trade-offs in real-world deployments.
59. Concerns exist regarding current generation of TDD technology applicability to SMCS and this will require further radio-frequency (RF) engineering work in industry standards bodies, particularly 3GPP. While operators and equipment and device vendors will need to work towards optimizing the process to minimize self-interference through the use of TDD bands in a quasi-FDD operation, we believe the Department should maintain its long-stated technology-neutral approach and not exclude TDD bands from the Framework, even if FDD bands remain the initial SMCS bands. Signaling such an approach will incentivize equipment vendors to

continue research and development, which long-term will maximize spectrum efficiency in Canada. At a minimum, the Department must clearly signal that such SMCS testing in TDD bands will be allowed prior to any future consultation.

Q6: ISED is seeking comments on any other bands that are used for commercial mobile services for which the SMCS framework should be applied.

60. Rogers does not propose initially authorizing the SMCS framework specifically for any other bands that are used for commercial mobile services. However, as per our comments in Q6, we do not think that future public consultation is required to apply the SMCS framework to additional mobile bands, including TDD bands. Any potential coexistence concerns should be addressed by technical regulations in conjunction with industry stakeholders at the RABC. Further, as also noted in above in response to Q4 / Q5, the Department should apply the SMCS framework to the Canadian Public Safety Broadband (700 MHz) spectrum due to the overwhelming public interest benefits of providing law enforcement organizations and emergency responders with a roadmap to enhance connectivity in deep rural and remote areas outside of public and private terrestrial network coverage.

61. As numerous 2500 MHz licensees have gone on the record in the Department's *Spectrum Outlook*, Rogers recommends exploring the conversion of the mobile Broadband Radio Service (BRS) 2500 MHz from a mixed Frequency Division Duplex (FDD) and Time Division Duplex (TDD) band to a TDD-only band plan.²¹ As the Department designated a potential conversion on the 2500 MHz band as a Priority 2 in the *Spectrum Outlook 2023 to 2027*, it makes sense to defer an SMCS authorization at this time, as technical regulations of the band may be in flux over the next few years. However, again, Rogers does not recommend that the SMCS Framework decision explicitly exclude or prevent any bands (FDD, TDD, or mixed) from being added through technical review at the RABC unless there are specific reasons that are not able to be addressed through technical measures.

²¹ Rogers, para 19, *Rogers Comments on SPB-005-22: Consultation on the Spectrum Outlook 2022 to 2026*.

Q7: ISED is seeking comments on its proposal to modify the CTFA to add new secondary mobile-satellite service allocations, through a footnote, for the provision of SMCS only.

62. Rogers generally supports the proposal to modify the Canadian Table of Frequency Allocations (CTFA) to add new secondary mobile-satellite service allocations, through a footnote, for the provision of SMCS only. However, we believe that the proposed footnote text should be altered. Specifically, we believe that edits should be made to the final proposed sentence.

Consultation Text: ADD Cxx: Additional allocation: The frequency bands 617-652 MHz/663-698 MHz, 698-756 MHz/777-787 MHz, 824-849 MHz/869-894 MHz, 1850-1915 MHz/1930-1995 MHz, and 1710-1780 MHz/2110-2180 MHz are also allocated to mobile-satellite service on a secondary basis, limited to the provision of supplemental mobile coverage by satellite (SMCS) only. Further, the use of these bands for SMCS shall be based upon not interfering with, or claiming protection from, any radio services.

Proposed alternative: Further, the use of these bands for SMCS shall be based upon not interfering with, or claiming protection from, any **primary** radio services.

63. Further, to ensure consistency between a secondary MSS allocation in the SMCS bands, Rogers recommends the Department harmonize MSS allocations with footnote 5.317 in relation to 806-890 MHz. As the provision of SMCS will be done through a secondary allocation, we believe the primary allocation given to MSS in 806-890 MHz, which does not cover the entirety of the Cellular 850 MHz band, is redundant and may cause confusion.

64. Rogers also recommends that the Department add a secondary MSS designation to the 700 MHz Public Safety band now in the CTFA, even if it ultimately decides that the SMCS will not immediately apply. With the recent launch of the PSBN governance consultation by Public Safety Canada, we believe it is in the public interest to remove all potential roadblocks from public safety agencies being able to access the coverage benefits of SMCS services as soon as possible.

Q8: ISED is seeking comments on its proposal to enable SMCS on a no-interference, no-protection basis with respect to all radiocommunication services.

65. Rogers generally supports the Department's proposal to enable SMCS on a no-interference, no-protection basis with respect to all **primary** radiocommunication services, as MSS will be added to terrestrial commercial mobile bands as a secondary service that will protect co-channel terrestrial networks. Establishing technical regulations is also essential to the deployment of SMCS services while ensuring protection of adjacent primary services. That said, even as a secondary designation operating on a no-interference, no-protection basis, the Department must ensure that any technical regulations and coexistence measures are not overly restrictive, thus preventing Canadians from being able to benefit from SMCS services.

66. In particular, Rogers is concerned that other mobile providers that wish to offer an SMCS service but may be further behind in their efforts to launch a commercial service may raise specious concerns rather than those based on good engineering practices. Similarly, the geostationary satellite industry that offers a differentiated but competing MSS service may seek to introduce overly restrictive coexistence measures in order to protect their own business models. This would be anti-competitive and self-serving and therefore the Department should remain vigilant against any such attempts.

Q9: ISED is seeking comments on the roles that SMCS and terrestrial mobile service expansion may play, as well as any potential limitations, in providing greater mobile service coverage to Canadians, including along roads and highways.

67. When Rogers initially announced plans in April 2023 to launch SMCS-type services, our stated aim was to bring satellite-to-mobile coverage nation-wide to ensure Canadians stay connected in areas beyond the limits of traditional wireless networks. In partnership with Lynk and SpaceX, we will expand satellite-to-mobile coverage across Canada's most remote regions, national parks and rural highways not covered by any wireless networks today. Combining LEO satellite constellations and Rogers' national wireless spectrum, we will ensure Canadians can access a wireless connection from coast to coast to coast to keep them connected and safe.

68. As the Department is aware, terrestrial network operators are continuously expanding their network coverage. As we highlight above, Canadian terrestrial mobile network operators have invested billions of dollars in spectrum and network infrastructure over the decades to continue expanding and enhancing terrestrial coverage in rural and remote areas. While the Canadians living in some rural and remote areas do not have the same connectivity options as those in urban areas (which governments and industry are working together to resolve), broadly speaking, Canadians currently have access to world-class mobile voice and broadband data services due to the facilities-based competition between national operators. Speaking of Rogers specifically, through our national network investments, we have Canada's largest and most reliable 5G network, which now covers over 2,300 communities. With our coming satellite-to-mobile service, we will cover every community in Canada outside our terrestrial network coverage, including remote Indigenous communities.
69. Significant technical and economic challenges exist for terrestrial network operators to fully cover Canada's large landmass, particularly in areas with limited (or no) population density to support deployments. While operators invest considerable resources in network planning and deployments wherever it is economically feasible and market-demand exists, ultimately, many rural and remote areas of Canada are both technically and economically unfeasible to serve with wide area terrestrial mobile wireless networks.
70. As an example, Rogers is working with the B.C. government, alongside the Government of Canada, in order to expand our wireless network and improve safety and reliable connectivity along Highway 16, often referred to as the Highway of Tears, in rural B.C. These expansions are made possible by leveraging financial support from the provincially funded Connecting British Columbia program, administered by Northern Development Initiative Trust and are part of Rogers' ongoing commitment to expand service and improve connectivity for underserved rural, remote, and Indigenous communities in the West, and across Canada.²²
71. Coverage expansion in this remote area costs approximately \$5 million **per site** to build. Not only are these remote sites costly and challenging to build, but they are also extremely costly to operate due to the fact that they are not serviced beyond the road access. One particular issue is power, as there is often no electricity running along the rural and remote roads and highways, meaning that alternative power sources are needed. Today, that generally means hydrocarbons (i.e.,

²² Rogers. *Rogers Expands its Wireless Network to Improve Safety and Provide Reliable Connectivity along Highways 16 and 14 in B.C.*, April 2021; <https://about.rogers.com/news-ideas/rogers-expands-its-wireless-network-to-improve-safety-and-provide-reliable-connectivity-along-highways-16-and-14-in-b-c/>.

diesel/propane), which necessitates regular refueling. SMCS coverage in remote areas like this, including along roads and highways, will allow mobile network operators to rapidly expand their coverage beyond their terrestrial footprints.

72. Potential limitations of SMCS coverage will result from the orbits of satellite constellations, especially for a polar country like Canada. That is a key reason for Rogers to partner with two different satellite operators. They each have different constellation orbits that provide different zones of coverage – including in the Far North. Another potential limitation, particularly in the early phases of SMCS deployments, will be the number of satellites in orbit. Relatedly, coverage from LEO constellations will be based on orbital paths and slant angles of the satellites, not terrestrial highways.
73. Altogether, SMCS will significantly expand mobile coverage in Canada, eventually reaching 100% of our landmass with a sufficient number of satellites and multiple orbits, and road and highway coverage will be part of that coverage. Ultimately, it will play a vital role closing the geographical digital divide.

Q10: ISED is seeking comments on its proposal that SMCS would not contribute to meeting deployment conditions associated with flexible use licences.

74. The Department's proposal that SMCS would not contribute to meeting deployment conditions associated with flexible use licences does not make good policy for Canada and could perversely result in SMCS services not being available to Canadians. In deep rural and remote areas where it is uneconomical to deploy new or expanded terrestrial network deployments, SMCS may be the ideal option for mobile operators to use to ensure Canadians get coverage. This is especially true in the Far North, which has a population density of 0.02 persons per square kilometre (Pops/km²) compared to Southern Ontario's 108.86 Pops/km².²³ Should the Department determine that the service Canadians are actively receiving through SMCS coverage does not count towards deployment requirements, it is possible that mobile operators could lose access to the spectrum, having the SMCS service terminated or impaired.
75. Further, while the Consultation notes that SMCS will be supplemental and a limited service offering in the near term, it is a rapidly evolving space. Rogers is currently working with our satellite partners to test different spectral amounts to assess

²³ Based on ISED supplied 2021 Population & Area data.

potential for broadband speeds. Mobile spectrum licensees, in partnership with satellite operators, will be evaluating the optimum amounts of spectrum to make available for commercial SMCS. Further, the technology is expected to be able to offer material throughputs in the mid-term, and well before many of the spectrum bands proposed for SMCS come towards the end of their licence term. Indeed, Rogers PCS and 850 MHz spectrum will be the earliest of the proposed SMCS spectrum bands to come up for renewal in 2031, six years after the SMCS Framework will come into effect.

76. Flexible use licensees are investing significant amounts of capital and devoting considerable internal resources into launching SMCS services as quickly as possible. Besides significant capital costs, ongoing operational costs to provide this service will be material. While the public benefit to Canadians is clear, particularly from a public safety perspective, business cases are still being evaluated and it may be some time before SMCS revenues offset costs. Injecting regulatory risk for mobile operators and their satellite partners could jeopardize the ability of Canadians to access the service and would most negatively impact citizens of the Far North. Rogers therefore believes that SMCS deployments should count towards coverage requirements.

Q11: ISED is seeking comments on any considerations and/or limitations in providing network reliability and resilience using SMCS, based on the requirements in the MOU on Telecommunications Reliability.

Q12: ISED is seeking views on any considerations and/or limitations to providing emergency roaming using SMCS based on the requirements in the MOU on Telecommunications Reliability.

77. It is much too early in the technological development and deployment of SMCS services to consider providing network reliability and resilience or emergency roaming based on the requirements in the MOU on Telecommunications Reliability. Differences in integration architecture may also limit the ability of a single SMCS licensee (earth station or satellite) to unilaterally enable future roaming solutions.
78. It is expected that at launch, SMCS satellites will primarily offer service in regions where major wireless operators do not currently have terrestrial coverage, particularly little to no overlapping coverage. It is important to note that having overlapping networks is a prerequisite under the MOU. In the event of a terrestrial outage in urban, suburban, and near rural areas, whether the home network or

another domestic network, SMCS services are thus not expected to initially provide much help from a pure coverage perspective. From a capacity perspective, again, initial SMCS services are expected to be texting only, with voice and limited data services as a follow-on. SMCS operators will not have sufficient capacity to replace their mobile partner's terrestrial coverage, let alone multiple mobile networks in the case of emergency roaming. This is especially true when talking about a national operator that carries around 30% national traffic, or a significant regional incumbent that may carry a material portion of local traffic. It is possible in the future that SMCS may be able to provide limited network reliability and resilience support for their partner mobile operator, but significant design work and implementation and testing will be required. We do not see a realistic path at this time to supporting emergency roaming; although, as discussed further below in Q13, 9-1-1 services for all Canadians, regardless of their mobile provider, will be made available as soon as SMCS services are able to support voice.

79. It should also be noted that it is expected that SMCS satellite operators will likely be considered a "distinct home network", meaning that emergency roaming provisions under the MOU would not be covered by existing relationships between mobile network operators. Only one satellite operator is a signatory to the MOU (i.e., Telesat Corporation, which does not currently have overlapping coverage with Rogers), but with the inherent capacity requirements and technology integration challenges with supporting multiple mobile operators, we do not foresee new SMCS satellite operators becoming signatories, particularly in the short term. This may change as SMCS technology becomes more robust with greater capacity but would only (potentially) occur over a much longer time horizon.

Q13: ISED is seeking comment on the technical possibilities and limitations of SMCS for the provision of 9-1-1 access to all handsets from all service providers where there is SMCS satellite coverage.

80. From our initial announcement to offer satellite-to-mobile service, Rogers has been fully committed to the provision of 9-1-1 access to handsets of all Canadians, whether a Rogers customer or not, where there is SMCS satellite coverage and the technology to support the voice functionality exists. Indeed, universal functionality of mobile communication standards are designed so that all mobiles can connect to 9-1-1 services even without a SIM card or mobile subscription with any carrier. While this will enable 9-1-1 possibilities, there are some technical limitations, particularly as the service is expected to initially offer only texting connectivity, with

voice services (and data) expected to come later. Any 9-1-1 services will also require close collaboration, testing and deployment with public safety agencies, as well as intermediary 9-1-1 call centres. To be clear, these universality standards are goals that SMCS providers are working towards but may not be immediately available at voice service launch, nor ultimately include every single legacy handset in use today that may already be a decade old.

81. SMCS will thus result in a complimentary 9-1-1 service to traditional mobile, not a substitute for traditional terrestrial connectivity. We believe it has the possibility to save lives but there will still be limitations, some of which will be overcome or reduced in the future. Some however may persist because of the inherent nature of the technology. For instance, WSPs will not be able to provide a triangulation-location similar to terrestrial networks, even with the technology evolving. Technical solutions are being explored, both from a network and user device perspective, to determine how precise location might be able to be shared when emergency services are activated. Location-based services might come bundled within an app; alternatively, operators could try to pull Global Positioning System (GPS) coordinates from devices. GPS, while highly accurate, may present technical challenges in how to extract the data from the phone and provide it to public safety agencies. With multiple satellite vendors and mobile network operators developing services, there may also be specific technical possibilities and limitations based on the provider. Regardless of the ultimate public safety interconnection architecture, however, SMCS will expand coverage outside of traditional mobile networks coverage, which will benefit Canadian public safety.
82. As ISSED is aware, the CRTC is responsible for and has established a comprehensive public safety framework including 9-1-1 (and Emergency Alerts, addressed below in Q14). In order to advance SMCS, the Emergency Services Working Group (ESWG), part of the CRTC Interconnection Steering Committee (CISC), is already working on 9-1-1 over satellite. The ESWG is composed of Telecommunication Service Providers, including Rogers, Public Safety Answering Points (PSAPs), and 9-1-1 Industry specialists, and there is no need for any duplicative efforts which could unintentionally insert confusion and delays. All regulators and the industry are aligned on the benefits of enhancing public safety through satellites. Finally, while the CRTC has forborne from mandating 9-1-1 access for texting services, except for hearing- or speech-impaired persons,²⁴ Rogers is prioritizing this connectivity to contribute to the safety of Canadians.

²⁴ CRTC, *ARCHIVED - Telecom Decision CRTC 2013-22: CISC Emergency Services Working Group – Consensus report regarding Text Messaging with 9-1-1 trial and service implementation*; <https://crtc.gc.ca/eng/archive/2013/2013-22.htm>.

83. In the early days of commercial SMCS service, providing texting-only via satellite, it may be possible to support basic text communications during an emergency situation, similar to Apple's Emergency SOS via satellite.²⁵ An intermediary 9-1-1 call centre would be used to verbally translate the information, back and forth, with the appropriate emergency center and/or PSAP. Rogers continues to investigate with satellite partners and stakeholders the feasibility of offering such a service, for an interim period only, until voice is supported by satellite operators. We again highlight that while all stakeholders are diligently investigating potential technology solutions, it is too early in the development SMCS services to know what will be feasible in the early phases of SMCS deployment.
84. In the future, SMCS is expected to support voice, SMS, and data. At such a time, it should be feasible to support voice 9-1-1, as well as "Text-with-911" (T911) which is currently being used by hearing impaired customers (who must first preregister to this service). For technical reasons, T911 necessitates a **silent 9-1-1 voice call** in order for the serving PSAP to start the texting communication. In areas where there is no PSAP, mobile operators may be able to use an intermediary 9-1-1 call centre, who will then set up a 3-way communication with the proper emergency centre, as exists today for terrestrial 9-1-1 services. (As SMCS will expand coverage into remote areas outside traditional PSAP operating areas, intermediary 9-1-1 call centres will be vital to connect Canadians with appropriate services, e.g. Canadian Search and Rescue or Coast Guard.) In this future state, all wireless end-users from other wireless service providers are expected to have access to voice 9-1-1 as per current practices, i.e. unregistered / unsubscribed 9-1-1. Further, it is expected that under NG9-1-1, wireless service providers will be able to offer Real Time Text (RTT) over satellite.
85. The satellite and mobile network operator industries continue to work through the technology issues but will require close collaboration from PSAPs. This is especially so as traditional PSAPs are already in the midst of transitioning from legacy 9-1-1 services to supporting next-generation 9-1-1 services. Technical possibilities and limitations of SMCS for 9-1-1 may also depend on how PSAPs are able to integrate new services and decisions on where to devote constrained resources on implementing intermediary solutions that may be quickly phased out versus more robust, long-term solutions.
86. However, Rogers remains extremely optimistic over SMCS' public safety potential. The wireless carriers, satellite providers and public safety agencies are all committed to overcoming any technological challenges and will continue their work

²⁵ Apple, *Use Emergency SOS via satellite on your iPhone*; <https://support.apple.com/en-ca/101573>.

to extend terrestrial emergency services to satellite over time, protecting the safety and welfare of Canadians across the entire country.

Q14: ISED is seeking comments on how SMCS deployments would support the distribution of emergency alerts to mobile devices.

87. Rogers believes that SMCS deployments will ultimately support the distribution of emergency alerts to mobile devices, but significant work will be required, as satellite operators today may not have the necessary infrastructure to support Wireless Public Alerting System (WPAS), including the technical capabilities to support the broadcast of messages nor interconnection with the WPAS alert aggregator.
88. The primary issue will be that satellite spot beams are much larger than terrestrial cell site/sector coverage areas, resulting in less granularity for targeting public alerts. While LEO satellites will have smaller and more precise beams than geostationary stationary satellites, work will be required to ensure any WPAS alert is limited to a single beam. MSS and mobile wireless operators in the U.S. and Canada are exploring potential spot-beam solutions for Public Alerting via satellite-to-mobile. However, this will mean that the minimum future SMCS WPAS size will be approximately 50-150km².
89. Relatedly, SMCS may provide coverage in areas that were never previously considered for WPAS alerts, particularly off-shore areas outside of traditional terrestrial network coverage. Additional development work may be required for WPAS to account for new geographic coverage areas.
90. All these technical issues should largely be able to be overcome through development work to create the appropriate data flows but will require coordination of all stakeholders from the satellite, mobile network operator, device manufacturer, and public safety communities. Additionally, the various LEO satellite systems may not initially offer continuous coverage over all areas of Canada, and this would be another (temporary) limitation in providing WPAS over SMCS.
91. While Rogers continues to work with our satellite providers on all issues related to public safety, it must be noted that, as per Telecom Regulatory Policy CRTC 2017-91, wireless public alerting over satellite is not mandated in Canada. Indeed, the CRTC determined that “the inability to undertake precise geo-targeting due to the nature of satellite beams would make the rollout of WPA on mobile satellite service

technologies impractical” and that it will not “require the implementation of WPA on pre-LTE networks or mobile satellite services.”²⁶ The CRTC’s determination is thus also applicable when considering emergency alerting over SMCS services. SMCS stakeholders however will continue their work to develop WPA capabilities and deploy when technologically feasible.

Q15: ISED is seeking comments on whether existing mechanisms will support emergency communications in the absence of a roaming agreement between providers, or whether a new obligation would be appropriate regarding this issue for SMCS.

92. As highlighted above, mobile communication standards (such as 3GPP) already exist to ensure that all standard mobile handsets, regardless of the existence of commercial roaming agreements, are able to access existing 9-1-1 services. This also applies to mobile handsets that have no active mobile subscription. Work is currently underway within CRTC CISC groups to explore interconnection and we see no technical limitations that would prevent emergency communications with 9-1-1 over SMCS, once the voice capabilities have been enabled, regardless of whether a roaming arrangement is in place. As with all new 9-1-1 services, extensive testing and collaboration with all stakeholders including PSAPs, would be required. However, we do not foresee any need for a new obligation regarding emergency communications in the absence of a roaming agreement between providers.

²⁶ CRTC, *Telecom Regulatory Policy CRTC 2017-91: Implementation of the National Public Alerting System by wireless service providers to protect Canadians*; <https://crtc.gc.ca/eng/archive/2017/2017-91.htm>.

Q16: ISED is seeking comments on its licensing proposals:

- a. to issue space station spectrum licences to Canadian satellite operators seeking to provide SMCS
- b. to issue FSAs to foreign satellite operators seeking to provide SMCS in Canada
- c. to issue generic earth station spectrum licences to flexible use licensees seeking to offer SMCS
- d. to limit the eligibility for SMCS earth station licences to flexible use licensees that are considered mobile service providers and that are in good standing with their existing flexible use licences, to authorize the subscriber devices that would be communicating with the SMCS satellites
- e. to issue all SMCS licences on a Tier 1 basis and to limit their scope to only those the service areas and frequency blocks held by the flexible use licensee where they plan to offer SMCS, as supported by the SMCS Agreement
- f. for FSAs and earth station licences, to require that an SMCS Agreement be in place and that specific provisions of that agreement be submitted to ISED as part of the application process
- g. for Canadian space station spectrum licences, to require that an SMCS Agreement be in place and that specific provisions be submitted to ISED for review prior to offering SMCS within Canadian territory
- h. to require that the following provisions of the SMCS Agreement be submitted to ISED for review as described in f) and g) above: the associated flexible use spectrum licences; the specific frequency blocks and areas (which must be part of the mobile service provider's spectrum holdings) where SMCS will be offered; a provision stating that the agreement is not exclusive; and any provisions dealing with interference management, coordination, compliance with technical rules; measures required to facilitate compliance with the SMCS earth station licence conditions; or any other aspects dealing with spectrum management; the signature page; and provisions related to the term of the agreement
- i. that separate licences be required for different pairings of mobile service provider and satellite operator

93. Rogers generally supports the proposed licensing, with the exception of any provision related to exclusivity as a general licensing requirement or, as discussed further below, a condition of licence. As the Department itself has identified, as SMCS is a new and developing technology, and is focused on remote and hard to

reach areas, and the availability of emergency calling on any SMCS network, there is no need to mandate a mandatory roaming condition.²⁷ These factors equally apply to potential exclusive commercial relationships between SMCS satellite operators and flexible use licensees. Forcing satellite operators to try and support multiple mobile network operators, particularly small operators that have limited resources to deploy advanced services based on proprietary technology, could actually prevent and would significantly delay the introduction of SMCS services in Canada. Thus, a non-exclusivity provision could unintentionally harm public safety in Canada.

94. The proposed non-exclusive provision is suggested in the Consultation document to ‘foster competition’ and ‘not constrain’ the deployment of SMCS. However, there is no basis for this claim and, in fact, the current competitive dynamic today shows that competition is alive and well, based on several partnerships between flexible use licensees and SMCS satellite providers. As highlighted above, competition between the facilities-based operators is what has driven technological advancement in the mobile industry, from general competing deployments of CDMA vs GSM technologies to the race to deploy the latest generation of technology, e.g., 4G LTE, 4G LTE Advanced, 5G NR, 5G Advanced, etc. This continues today with SMCS services, with multiple network operators working with satellite partners to be first to deploy this technology.
95. While Rogers was the first to publicly announce our partnerships with Lynk and SpaceX, Bell is an investor in AST SpaceMobile with several global mobile operators and Telus has partnered with Terrestar on satellite to mobile services. Telus publicly announced a successful technology demonstration with Terrestar in November 2023, while AST SpaceMobile has also announced several successful trials.²⁸ Bell also highlights on their own website that a fellow investor and leading Japanese mobile network operator intends to launch services on AST SpaceMobile in 2026.²⁹ This is just a sample of announcements, it is possible that additional partnerships with other flexible use licensees are underway but have yet to be publicized. SMCS competition is clearly already very much alive in Canada.

²⁷ ISED, *Consultation*, para 98.

²⁸ Telus, *TELUS, Terrestar and Skylo demonstrate Canada’s first two-way communication between smartphones and satellites*, 1 November 2023; <https://www.telus.com/en/about/news-and-events/media-releases/telus-terrestar-and-skylo-demonstrate-canadas-first-two-way-communication-between-smartphones-and-satellites>.

AST Space Mobile, *AST SpaceMobile Achieves Space-Based 5G Cellular Broadband Connectivity From Everyday Smartphones, Another Historic World First*, 19 September 2023; <https://ast-science.com/2023/09/19/ast-spacemobile-achieves-space-based-5g-cellular-broadband-connectivity-from-everyday-smartphones-another-historic-world-first/>.

²⁹ Bell Ventures, “Rakuten Mobile and AST SpaceMobile Aim to Launch Service in 2026”, accessed 15 August 2024; <https://bce.ca/about-bce/bell-ventures/news>.

96. These four LEO satellite operators are seemingly furthest along in SMCS technology development, however, there are numerous other LEO satellite vendors in various stages of constellation development and deployment, including Eutelsat's OneWeb, Telesat's Lightspeed (of which the Government of Canada is a significant investor), Rivada Space Networks, and Amazon's Kuiper Systems. Unlike geostationary satellites that are massive satellites with long-life spans, LEO satellites are relatively short lived and being constantly refreshed. The technology lifecycle of LEO satellites could support other operators adding SMCS services to future generations of their constellation, thus further increasing the availability of SMCS providers. Indeed, Omnispace, another LEO operator, is currently exploring providing satellite to mobile services with telcos in Africa, South Asia, Southeast Asia and island countries in the South Pacific.³⁰
97. The Department must also consider that many jurisdictions are looking to support and deploy SMCS services. The Consultation highlights some other jurisdictions considering the regulatory implications or possible measures to facilitate satellite transmission in mobile frequency bands. Indeed, since ISED launched the SMCS Consultation, Ofcom launched a formal consultation that includes exploring direct-to-device in mobile spectrum and states, "We are considering potential authorisation options for D2D services in the UK prior to WRC-27".³¹ The FCC already has their SCS regime in-place, and several countries already have SMCS commercial services today. Canada is in a fierce global competition for specialized engineering resources. Forcing SMCS satellite providers to duplicate activities and spread engineering resources across multiple Canadian operators that may not all have the same level of commitment and engineering resources could result in Canada being deprioritized. Rogers is aware of challenges securing resources for Canada due to regulatory uncertainty around developmental licensing flexibility.
98. Clearly, SMCS services are already very competitive without the need for any non-exclusivity condition. The beneficiaries of this existing SMCS competition will be Canadians. The Department should be wary of introducing unnecessary – and ultimately counterproductive – regulatory measures into such a dynamic space that will end up harming network deployments. In particular, existing exclusive relationships, which have played, and will continue to play, important roles in the

³⁰ Rainbow, Jason, "Omnispace to test direct-to-smartphone LEO plans with Africa's biggest telco," *Space News*, 13 March 2024; <https://spacenews.com/omnispace-to-test-direct-to-smartphone-leo-plans-with-africas-biggest-telco/>.

³¹ Ofcom, Section 5.21, *Improving mobile connectivity from the sky and space: Spectrum for Direct to Device and Mobile Satellite Services*; <https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-2-6-weeks/call-for-input-improving-mobile-connectivity-from-the-sky-and-space/main-documents/call-for-input-improving-mobile-connectivity-from-the-sky-and-space.pdf?v=370909>.

development of satellite to mobile service, should be allowed to continue, recognizing the contribution the partnership had in bringing SMCS to market.

99. Finally, a recent report from telecommunication research firm Analysis Mason suggests that while satellite-to-mobile could generate material global revenues between 2022 and 2032, the bulk of that revenue will only come later and in the voice and data phases.³² In fact, they highlight that early phases of the service will likely have limited direct revenue opportunities even though end-users [and governments] value these potentially lifesaving features. Having unnecessary and unwarranted regulatory intervention into competitive partnerships at this time will thus only serve to slow SMCS deployments.

Q17: ISED is seeking comments on any potential use cases for SMCS in waters that are outside of flexible use service areas (e.g. off-shore), and how such use could be coordinated.

100. There are a number of potential use cases for SMCS in waters that are outside of flexible use service areas (e.g., off-shore), traditionally extended 12 nautical miles off Canada's coast. To maximize coordination with terrestrial networks and domestic mobile SMCS providers, and ensure Canadian territorial sovereignty is maintained, the Department should explore options compatible with international law to extend spectrum licences out to the 200 nautical mile limit of Canada's exclusive economic zone (EEZ).
101. We note that in 2022 the FCC Wireless Telecommunications Bureau established WT Docket No. 22-204, *Notice of Inquiry: Facilitating Access to Spectrum for Offshore Uses and Operations*, to gather information on offshore operation use cases and their potential.³³ We encourage the Department to monitor the process and leverage any forthcoming FCC consultations and to extend Canadian spectrum sovereignty to the EEZ limits.
102. Outside of Canada's territorial waters, we believe that SMCS use in international waters will likely be on a no interference, no protection basis. Satellite operators are expected to explore opportunities to provide service to commercial vessels

³² Analysys Mason, *Satellite direct-to-device technology needs to evolve through four phases before reaching its full potential*, March 2024;
https://www.analysysmason.com/contentassets/7c01d1d7d2614309a3f2db8b64adbce7/analysys_mason_satellite_d2d_phases_mar2024_nsi039.pdf.

³³ FCC, WT Docket No. 22-204: *Facilitating Access to Spectrum for Offshore Uses and Operations*;
https://docs.fcc.gov/public/attachments/FCC-22-41A1_Rcd.pdf.

(e.g., maritime shipping, deep-sea fishing, scientific research, resource exploration), while also supporting some governmental operations within the EEZ – such as Coast Guard search and rescue operations and governmental research.

103. Many of these parties may already use legacy MSS satellite phone and internet services but may be interested in exploring a more efficient, reliable, and cost-effective alternative. LEO constellation coverage may provide technical benefits over geostationary satellite services for a variety of use cases, including fixed Internet services, weather monitoring stations, emergency satellite tracking devices, etc. These devices could use SMCS coverage for voice-enabled or data-only services.
104. Off-shore SMCS usage may raise concerns about coexistence and potential interference with existing maritime and space communications. If the SMCS satellite operator is licensed by a country such as Canada that has signed on to the ITU Radio Regulations, our view is that the satellite operator would need to comply with applicable ITU filing and coordination requirements. Usage of commercial mobile bands for SMCS within the territorial sea of another country would be subject to the rules of that country. In international waters our side of the exclusive economic zone, we believe that a combination of ITU requirements and Laws of the Sea will govern coordination issues.
105. Rogers is aware that government public safety agencies today use licensed commercial mobile spectrum in areas outside of traditional terrestrial coverage to support search and rescue operations. Rogers has always strongly supported Canadian public safety. We encourage the Department to direct the appropriate public safety agencies to coordinate with mobile licensees to ensure that future SMCS services and any search and rescue activities using commercial mobile spectrum can coexist. Mobile operators and public safety agencies will all desire the same outcome, a quick and successful search and rescue, but we want to ensure that Canadians are still able to access the SMCS service for general public safety that may not rise to the level of needing the dispatch of Coast Guard or Canadian Search and Rescue services.

Q18: ISED is seeking comments on its proposals on licence term:

- a. For Canadian space station spectrum licences and foreign satellite approvals: a term that either aligns with the associated flexible use spectrum licence term or with the termination date of the agreement between the flexible use licensee and its partner satellite operator, whichever is earlier.
- b. For generic earth station licences: annual spectrum licences for SMCS earth stations that will expire on March 31 of each year, with a high expectation of renewal. Licences would be renewed annually until the flexible use spectrum licence term ends, or when the associated SMCS Agreement is terminated, whichever is earlier.

106. Rogers generally supports the proposal that Canadian space station spectrum licences and foreign satellite approvals be granted a term that either aligns with the associated flexible use spectrum licence term or with the termination date of the agreement between the flexible use licensee and its partner satellite operator, whichever is earlier. As the SMCS is a commercial arrangement between the flexible use licensee and its satellite operator partner, it makes sense to tie the satellite term to the licence term or commercial termination date.

107. The Department should use this same licence term for the generic earth station licences, aligning with the associated flexible use spectrum licence term or with the termination date of the agreement between the flexible use licensee and its partner satellite operator, whichever is earlier.

108. There is no rationale for an annual licence renewal process for generic earth stations, particularly when the service is partnered with the longer term associated satellite licence. Both licences are required to provide an SMCS service, it cannot be done with only one of the two. Requiring an annual renewal of generic earth station licence, even with a high expectation of renewal, simply creates an onerous administrative burden on the Department, flexible use licensees, and their partner satellite operators. It is possible in the case of a 20-year flexible use licence term that there could be a single satellite application and 20 generic earth station applications.

109. The Department has already proposed to have a process to allow SMCS licences to be modified should the frequency bands or coverage areas within an SMCS Agreement be updated.³⁴ This process will allow for either a satellite SMCS

³⁴ ISED, *Consultation*, para 86.

authorization or generic earth station licence to be updated so, again, there appears to be little benefit and significant administrative burden to annual renewals. The Department is also proposing annual reporting requirements as a condition of licence, which further makes annual renewals of generic earth station licences as redundant and administratively onerous on the Department and licensees.

Q19: ISED is seeking comments on its proposals to:

- a. impose conditions of licence for Canadian satellite spectrum licences to providing SMCS in Canada as set out in annex A
- b. impose conditions on approvals issued to foreign-licensed satellites providing SMCS in Canada as set out in annex B
- c. impose conditions of licence for SMCS generic earth station spectrum licences, as set out in annex C
- d. not to allow the division, transfer or subordination of SMCS licences

110. Rogers does not support the proposed conditions of licence (COL) for Canadian or foreign-licensed satellites providing SMCS in Canada, and SMCS generic earth station spectrum licences related to mandatory roaming and non-exclusivity. We also recommend modifications to COLs related to lawful intercept and annual reporting.

Roaming

111. As discussed further below in Q20, Rogers does not support the inclusion of a COL for roaming. While we have supported *CPC-2-0-17, Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements* for terrestrial services in the past, SMCS is a new and emerging service with access services provided by satellite. Significant development work is being undertaken by satellite vendors and mobile network operators to simply enable the service. Requiring the primary partners to devote significant resources to enable mandatory roaming will slow the deployment of the service. As has been clearly documented, SMCS is expected, and Rogers has committed, to provide 9-1-1 services to all Canadians, regardless of their wireless service provider, as soon as it becomes technically feasible to provide 9-1-1 services.

112. Furthermore, integration architectures may be different between various satellite and mobile network operators. It is possible that a flexible use licensee is

effectively “roaming” on a satellite provider. Other operators cannot seek roaming access on a Canadian operator that is roaming on a visited network in another jurisdiction, the same should be true for SMCS operations.

113. The Department should also not include a COL mandating non-exclusivity for all the reasons outlined above in Q16. The commercial relationships between wireless carriers and satellite providers have been instrumental in developing satellite to mobile technology and will remain essential going forward. It is also not clear that individual SMCS operators will initially have sufficient capacity to support multiple mobile network operators. Further, there are multiple satellite operators looking to provide SMCS services, with several additional LEO satellite operators that may be able to support SMCS services in the near future.

Lawful Intercept

114. With respect to lawful interception, it is important to note that mobile spectrum licensees, such as Rogers, have a long history of cooperation with law enforcement and security agencies, subject to appropriate legal processes and judicial oversight. Moreover, Rogers’ significant investment in the technology, resources and expertise that are required to support lawful interception activities is a substantial benefit that accrues directly to the Canadian public.
115. The Department should harmonize any lawful enforcement COL related to SMCS with respect to commercial mobile spectrum bands. Specifically, the COL should apply to voice telephony. Further, we strongly believe that any lawful interception obligations, imposed as a condition of licence or pursuant to legislation, should be limited to capabilities that are provided for in industry standards and incorporated in commercially available equipment. This is particularly true for SMCS services with multiple, emerging integration architectures, which may dictate on which SMCS licensee lawful requests should be served. Defining lawful intercept requirements based on industry standards will result in greater availability of technology, better on-going support, and lower cost than non-standardized requirements.
116. We believe that the Department should clarify the proposed wording of the condition of licence such that the lawful interception capabilities that must be maintained will be limited to those capabilities that are provided for in industry standards and incorporated in commercially available equipment and only applies to voice telephony. Further, we fully support the Department’s commitment to working with Public Safety Canada and SMCS licensees to not enforce requirements are not reasonably achievable.

Annual Reporting

117. The annual reporting COL proposes that licensees include “a statement indicating the annual gross operating revenues from the provision of wireless services in Canada and the annual adjusted gross revenues resulting from the use of this licence.”³⁵ Flexible use licences currently provide the gross annual operating revenues and adjusted gross revenues for R&D filings with ISED as a part of their annual reporting. Rogers does not split this information out by spectrum licence, as we do not split revenue by spectrum band. Depending on the final configuration of SMCS services at the commercial launch of these services and how ISED licences SMCS services, it may not be possible to segregate SMCS revenue by band.
118. The Department also should generally modify any annual reporting condition of licence in order to help reduce administrative burdens for both the Department and licence holders. Current annual reports consume significant resources within mobile network operators to generate and appear to provide uncertain value for ISED at such a high frequency. Alternative models for reporting requirements could involve moving to an “as-requested” model, where carriers are only obligated to provide only those documents specifically requested by ISED each year or increasing the length of time between the provision of certain reports, particularly after the first few years of SMCS services. Such a move would reduce the administrative burden on operators, as well as the Department, while still ensuring ISED can adequately monitor spectrum licensees to fulfill its mandate.

Q20: ISED seeks comments on whether Option 1 (implement a mandatory roaming requirement for SMCS licences that would take effect 5 years following the publication of a decision) or Option 2 (not impose a mandatory roaming requirement) would be most appropriate. Alternate options supported with a strong rationale may also be considered.

119. Option 2, not imposing a mandatory roaming requirement, is the best policy choice to ensure that the greatest number of Canadians will be able to quickly benefit from SMCS services. This includes providing all Canadians, regardless of their wireless service provider, access to 9-1-1 services in remote areas outside of terrestrial coverage. For all the reasons provided below, Rogers does not support Option 1, as there is no competitive reason to do so, and the technical challenges described below will likely take longer than 5 years to resolve.

³⁵ ISED, *Consultation*, Annex C: C14.

120. The Consultation itself lists a number of important factors explaining why mandatory roaming should not apply, including that to-date roaming has only been considered on terrestrial mobile networks; SMCS is a new and emerging technology; and, as the SMCS market and technology are in an early stage of development, it may not be practical to apply mandatory roaming.³⁶ We fully agree with these reasons that mandatory roaming is not required for SMCS networks, and explore them further below.
121. First, as highlighted above, there is a developing competitive market for SMCS services. In Canada, facilities-based mobile network operators are the ones bringing innovative new connectivity services to the market. Multiple mobile operators have publicly announced partnerships with leading SMCS satellite operators, so clearly WSPs can enter into arrangements with their own SMCS provider. With numerous other LEO satellite operators launching and constantly refreshing their constellations, as highlighted above, it is only a matter of time until additional SMCS providers will looking to partner with WSPs. Clearly, there is no demonstrated market failure that would indicate the need for mandated roaming.
122. Second, since all service providers are expected to offer 9-1-1 connectivity to handsets even in the absence of a roaming agreement (once technologically feasible), a position that Rogers has publicly stated numerous times, mandatory roaming has no bearing on 9-1-1 access. Indeed, the Consultation itself recognizes that the availability of emergency calling on any SMCS network is sufficient to address critical public safety concerns without requiring full mandatory roaming conditions. There is no public safety issue that mandatory roaming would solve.
123. SMCS is at the cutting-edge of mobile connectivity, a new and developing technology that is looking to combine the challenging technical requirements of both the mobile and satellite industries. Significant and pioneering development work is required to make this technology work for the satellites, mobile networks, and unmodified mobile devices. Diverting specialized engineering resources to develop roaming solutions for such a nascent and dynamic technology risks slowing down actual deployments. Further, mandatory roaming might simply be infeasible given LEO bandwidth limitations, the small initial number of satellites, and other technical challenges. While Rogers has had successful technology trials with our satellite partners, significant work remains prior to the service being robust enough to support any commercial offering. Commercial SMCS service is also expected to launch in phases, with texting services being initially offered and then voice and data services later.

³⁶ ISED, Consultation, para 96.

124. Should the satellite and mobile industries overcome the technical challenges, WSPs would be free to negotiate commercial roaming agreements when and where it makes sense to do so. Again, this is something that is explicitly recognized in the Consultation document. WSPs would also be able to approach the appropriate roaming partner, depending on integration architecture and spectrum access rights.

125. A mandatory roaming obligation for SMCS services is thus not required and could result in delaying SMCS services being made available in Canada and the degrading of SMCS services once launched. Such an obligation is a poor policy choice for Canadians for such a dynamic and emerging service.

Q21: ISED is seeking comments on the above proposed licence fees and service standards.

126. Rogers does not support the proposed licence fees and service standards, specifically the proposal that generic earth station spectrum licences for SMCS be subject to the fee as set out in *Notice No. SMSE-002-23, Fee Order for Earth Stations*. The proposed SMCS bands have always been subject to annual fees, been acquired at significant cost at auction, or some combination of these factors. The Department already collects significant revenues from SMCS spectrum via auctions and annual fees that no additional fees are required, since it would amount to collecting fees twice for the same spectrum. The commercial mobile industry has spent nearly \$17 billion acquiring SMCS-capable spectrum at auction and currently pays \$228 million in annual fees for spectrum off initial auction terms.³⁷ Should the Department ultimately elect to impose fees related to SMCS licensing, they should be strictly administrative cost-recovery.

127. The Consultation proposal for fees applied to SMCS spectrum is based on the amount of spectrum assigned in specific frequency bands and would apply immediately upon issuance of the earth station spectrum licence. As noted above, SMCS services are not expected to be materially revenue generating, at least initially, while also being capital and resource intensive in their launch phases. Flexible use licensees will also need to determine how much of their commercial mobile holdings to dedicate for SMCS services and not have it available for terrestrial network expansion. Layering on additional spectrum costs for flexible

³⁷ Based on ISED auction data and annual fee rates applied to all licensed Cellular and PCS spectrum. All auction costs are nominal, does not account for inflation nor cost-of-capital. 800 MHz Cellular and PCS bands subject to annual increases, as per *Service Fees Act*.

use licensees is an unnecessary burden and a poor policy choice for Canadians, particularly if mobile operators seek to license all their commercial mobile spectrum for SMCS eligibility in order to maximize satellite coverage and potential capacity.

128. The Department should instead adopt a fee that is strictly based on administrative cost-recovery. It is inappropriate to double charge mobile network operators – and thus Canadian wireless consumers. The benefits to Canadian public safety of SMCS services should be prioritized over potential government revenues.

Q22: Technical requirements to be applied to commercial mobile user equipment for SMCS: ISED is seeking comments on its proposal that existing technical requirements in the relevant SRSP and RSS in each frequency band would be sufficient for UE for SMCS.

129. Rogers recommends that the Department generally align with U.S. UE standards and to continue to monitor any future developments. Canadian operators rely heavily on the economies-of-scale of commercial devices made available to U.S. consumer and therefore Canada-only device specifications should be discouraged.

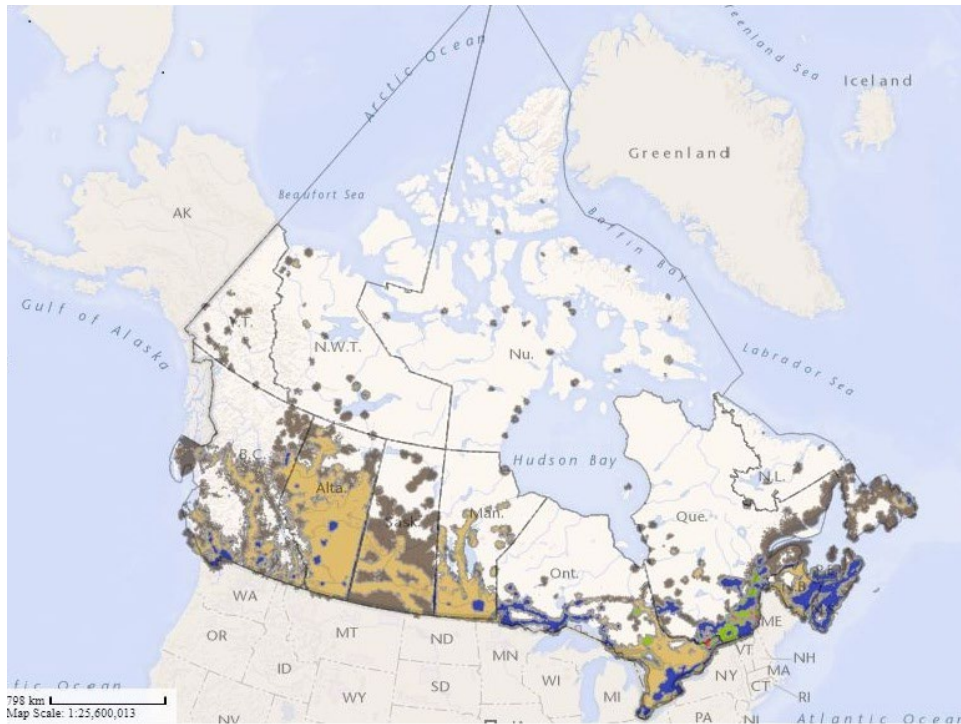
Q23: **Technical requirements to be applied to SMCS space stations:** ISED is seeking comments on its proposal to apply the same technical requirements and coexistence measures, such as maximum field strength or power flux density, and unwanted limits, stipulated in the existing applicable SRSPs and RSS for terrestrial commercial mobile services in the respective band of interest, to space stations for SMCS. ISED is also seeking comments on whether the specified general provisions in existing technical standards are sufficient to enable SMCS and to facilitate coexistence with terrestrial operations. ISED is also seeking comments on any additional technical requirements that may be needed for space stations for SMCS.

130. Similar to our recommendation in Q22 for UEs, the Department should generally align with equivalent U.S. RSS/SRSP requirements for SMCS space stations. For example, current Canadian SRSP requirements for the 850 MHz band, which are not aligned with U.S., may be too stringent and limit the deployment of FCC certified equipment in Canada. Aligning with U.S. SRSP requirements for the 850 MHz band will still fully protect Public Safety users in the adjacent 800 MHz band

since the SMCS radios are 500km above ground. As such, any SRSP limitations to terrestrial systems should be dismissed for installations in space.

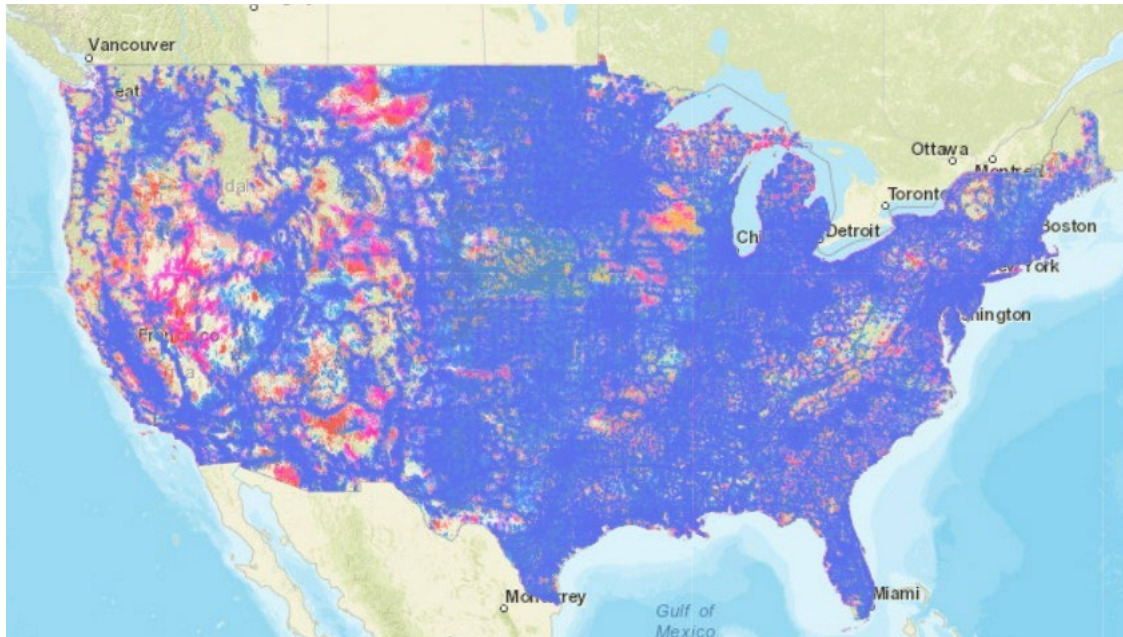
131. For certainty, we recommend that all existing RSS requirements should be applied, including *RSS-132 — Cellular Systems Operating in the Bands 824-849 MHz and 869-894 MHz, Issue 4*, but all SRSP power reductions meant for terrestrial service should be dismissed. Since many satellite stations could be operating over the U.S. prior to transiting into Canada, all Canadian hardware specifications should be fully aligned with U.S. standards.
132. We also support applying PFD limits from existing Canadian SRSPs, since the protection is common to both terrestrial and satellite cases. This may not necessarily align with U.S. SCS values, which in some cases could be less stringent. While the Canadian PFD limits should be maintained, the Department should continue its practice of allowing operators to mutually agree upon alternate thresholds, thereby providing both cross-boundary protection when needed, as well as full flexibility to enable coordinated continuity of service.
133. Regarding SpaceX's request for slightly higher power in the PCS band, the Canadian context provides even more support for such a move due to lower coexistence challenges. In particular, the PCS band has larger tiers and more uniformity of licensing, particularly when existing network partnerships are taken into account. ISED's tier-based approach will allow providers to better control coexistence into adjacent bands and areas. Further, since satellite stations are located in low earth orbit (LEO) approximately 500km above the earth, overcoming considerable radio-frequency pathloss is a major consideration to ensuring functional service. As such, mobile satellite operators will continue to innovate their payloads by exploring higher gain antenna solutions, which are used to direct more energy to the user and away from others. Therefore, it is possible that the current SRSP limits for effective isotropic radiated power (e.i.r.p.) are insufficient to accommodate these higher e.i.r.p. levels and therefore the thresholds may need to be revisited in the future. Keeping in mind that ground level interference will be limited by PFD thresholds and that human safety concerns (i.e., Safety Code 6) in space are not the same as on earth, increasing space station e.i.r.p. levels may help in providing more reliable service, especially for systems operating above 1 GHz.
134. We recommend the Department take a flexible approach in Canada, particularly when considering differences in geographical network coverage between Canada and the U.S. As can be seen in comparison of Image 1 and 2, most of the continental U.S. geography has been covered by terrestrial networks owing to the

Image 1. 2022 Canadian LTE coverage by facilities-based networks³⁸



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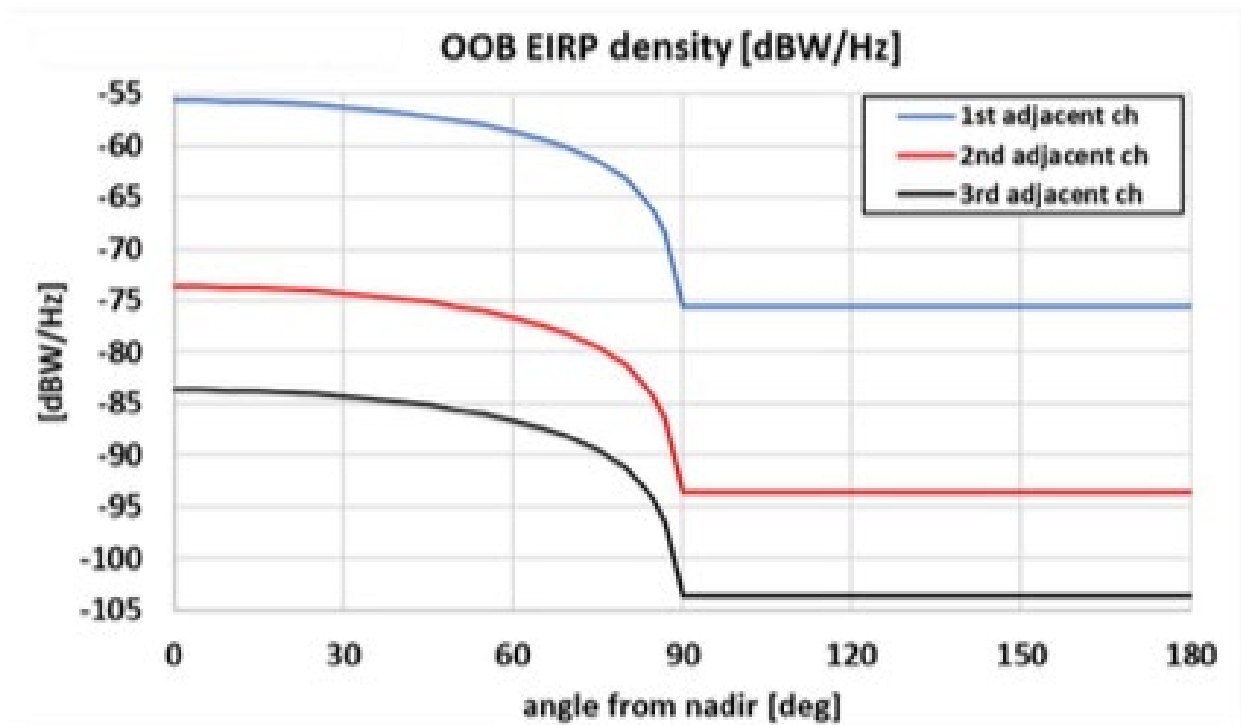
Image 2. 2021 U.S. LTE Coverage by Facilities-based Mobile Network Operators³⁹



135. As presented to the FCC in the public record, SpaceX has conducted analysis (see Image 3) representing a worst-case per-satellite out-of-band interference level assuming operation at maximum transmission power across an entire 5 MHz downlink channel, i.e., characterization of the highest possible emissions from the satellite given a 5 MHz carrier. It is important to emphasize that this is on a per satellite basis. Further, SpaceX is requesting an OOB PFD limit for the PCS carrier that adheres to the same globally accepted -6 dB I/N limit as defined by the ITU to sufficiently protect terrestrial networks.

³⁹ FCC, *4G LTE Coverage as of May 15, 2021* (AT&T Mobility, T-Mobile, UScellular, Verizon); <https://fcc.maps.arcgis.com/apps/webappviewer/index.html?id=6c1b2e73d9d749cdb7bc88a0d1bdd25b>.

Image 3. OOB Behaviour, including PCS A Block⁴⁰



136. The FCC Supplemental Coverage from Space OOB aggregate PFD was never intended to apply internationally and must be viewed in the context of being specific to the U.S. SCS framework. SpaceX's FCC filings state that the aggregate limit is not technically sound, as it does not take into consideration the role of frequency or the practical considerations of deployed services in adjacent bands. It also does not offer an opportunity to arrive at more efficient limits (e.g. coordination with relevant incumbents, as is allowed in terrestrial services).

137. The Department should view potential concerns raised by competitors with a critical eye and from the perspective of good engineering practices. Higher power in the PCS band, as requested by SpaceX in the U.S., should ensure no coexistence issues in Canada, particularly in remote areas. We again recommend the Department continue to monitor the FCC proceedings and ensure that the Canadian SMCS Framework and any related technical regulations retain enough flexibility to accommodate updates with the FCC's SCS framework in order to maximize SMCS coverage and optimize coexistence with terrestrial networks.

⁴⁰ SpaceX, *CONSOLIDATED OPPOSITION TO PETITIONS AND RESPONSE TO COMMENTS OF SPACE EXPLORATION HOLDINGS, LLC*; <https://www.fcc.gov/ecfs/document/10823080475644/1>.

Q24: Interference resolution: Given that SMCS is proposed to operate on a NINP basis, ISED is seeking comments on its proposal to require operators of SMCS (both earth stations and satellite licensees) to assume the onus of mitigating any interference that occurs to licensed in-band and/or adjacent band/block terrestrial operations. ISED is seeking comments on any potential challenges in complying with the existing coexistence measures prescribed in the applicable technical standards.

138. Rogers generally supports the proposal to require operators of SMCS (both earth stations and satellite licensees) to assume the onus of mitigating any interference that occurs to licensed in-band and/or adjacent band/block terrestrial primary operations. If potential interference is experienced, the impacted licensee should notify the mobile network operator and the partnered SMCS operator to work together to resolve the issue. That said, the Department should be prepared to support coexistence measures based on good engineering practices by SMCS earth station and satellite licensees. Rogers remains concerned that some mobile network operators may raise spurious interference concerns to unduly slow competitors from coming to market with commercial SMCS services first, which, in a worst-case-scenario, could put Canadian public safety at-risk.
139. Satellite operators are diligently working to ensure that SMCS networks will provide protection and coexistence with terrestrial mobile networks and adjacent services. For example, Lynk has developed a comprehensive interference mitigation analysis as part of the company's commercial application to the FCC. This analysis includes a description of how beams can be deployed from satellites to provide cellular coverage on the Earth in a manner that is compatible with existing terrestrial commercial mobile frequencies, including Canadian flexible use spectrum. Fundamentally, the deployment plan would follow a procedure that is similar to a typical terrestrial cellular mobile network planning procedure. Since mobile network operators who have license/authority to deploy the spectrum are directly partnering with SMCS satellite providers, there is a high degree of incentive and alignment to mitigate internal interference to the terrestrial and space network, since harmful interference would degrade the service. As a result, mobile network operators will continue to use their licensed spectrum to deploy services to end-users – either through terrestrial mobile or space SMCS networks – in a way that ensures coexistence and minimizes, or mitigates, interference scenarios. Regulatory borders, whether domestic licence areas or international boundaries, can be managed in the same way they are today in the terrestrial regime by

conforming to existing power flux density (PFD) thresholds in the relevant technical regulations, including Standard Radio System Plans (SRSPs).

140. For further information regarding interference mitigation, we refer the Department to publicly available documents available on the FCC website.⁴¹ Specific sections of relevance in this document would be:

- Section III. A. Power Flux Density of Lynk's Service Link (Page 11-12), which highlights the proposal to conform the cell edge condition to not exceed the PFD limits already set by the FCC for terrestrial services with respect to adjacent service areas (40 dBuV/m as set forth in 47 CFR §22.983(a));
- Section III. B. Cell Size Adjusted via Satellite Transmit Power (Page 13-14) and Section III. C. Example Spot Beam Simulation (Page 14-21), showing how the satellite spot beams from SMCS providers can be adjusted in transmit power to conform a beam to a circular cell on the earth and prevent excessive PFD overflow into adjacent areas; and,
- Section V. Co-Channel Interference Analysis (Page 23-50), which illustrates a detailed analysis on the probability of harmful interference from SMCS provider services on existing terrestrial spectrum. Further, (Page 34-50) illustrates a specific case study for a real-world network in the Bahamas which deploys a heterogenous network of multiple frequency bands. The concept of geospatial and spectral orthogonality with regard to beam deployment to avoid harmful interference is described here and supported with a real-world example. In particular, the analysis shows the use of co-channel spectrum in the 850 band between the terrestrial network and the space network, which is highlighted in Figure 24 (Page 44). The use of this spectrum would be deployed from the spacecraft on beams in locations that are well planned out in practice, but (Page 44-49) also demonstrate that the Bahamas network is robust to harmful interference even in the event of co-channel overlap in the 850 band between the terrestrial and space network.

⁴¹ Lynk, *UHF Interference Mitigation Analysis*, SAT-LOA-20210511-00064; https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/attachment_menu.htm?id_app_num=137811&acct=803602&id_form_num=12&filing_key=-461013.

Q25: Coexistence between SMCS space stations: ISED is seeking comments on its expectation that operators of SMCS space stations coordinate their constellations and resolve any case of interference between them that may arise.

141. Rogers supports the expectation that operators of SMCS space stations coordinate their constellations and resolve any case of interference between them that may arise, which aligns with a secondary no-interference, no-protection allocation for SMCS services.

Q26: Protection of radio astronomy services: ISED is seeking comments on its proposal to require SMCS satellites to meet the protection criteria as set out in Recommendations ITU-R RA.769-2 and ITU-R RA.1513-2, for the applicable radioastronomy frequency bands.

142. Rogers generally supports the proposal to require SMCS satellites to meet the protection criteria as set out in Recommendations ITU-R RA.769-2 and ITU-R RA.1513-2, for the applicable radioastronomy frequency bands.

143. The frequency bands that ISED has proposed for the SMCS framework do not include any allocations for radio astronomy. SMCS operators should avoid using allocated Radio Astronomy frequencies for their service bands and provide sufficient out-of-band-emission (OOBE) protection to ensure no interference from the SMCS service. In other bands, SMCS providers should be encouraged to coordinate with the astronomy community to minimize any potential impact of SMCS operations in other radio astronomy efforts where and when possible. ISED should not require such coordination, but it should be encouraged.

144. In addition, SMCS operators should be encouraged to work with the astronomy community to investigate, test, demonstrate, and implement best practices reducing or eliminating visual interference from satellites. SpaceX has done the most work in this field of all satellite operators. Lynk and SpaceX are working with the International Astronomical Union Centre for the Protection of the Dark and Quiet Sky from Satellite Constellation Interference (IAU-CPS) to that end. The Department should monitor similar efforts in peer jurisdictions to adopt any relevant best practices for Canada.

Q27: Cross-border coexistence: ISED is seeking comments on its proposal to apply existing cross-border rules, as defined in the applicable TRAA, and on whether other technical considerations must be taken into account to ensure protection of cross-border terrestrial operations.

145. Rogers generally supports the proposal to apply existing cross-border rules, as defined in the applicable terrestrial radiocom agreements and arrangement (TRAA), to ensure protection of cross-border terrestrial operations. ISED should, however, defer to its standard practice to allow terrestrial operators on both sides of the border to determine the optimum outcome. We believe that any potential issues will largely be resolved through inter-carrier negotiations, as happens today, to solve any cases of incidental roaming or coexistence of terrestrial mobile network coverage along the border. Mobile network operators and their satellite partners will extend these best practices to SMCS services, backstopped by the relevant international agreements.

146. For certainty, Rogers supports that any border area PFD limits at ground level produced by a station located in the other country's territory should be permitted to be exceeded through agreement between the licensees and ISED and FCC, subject to normal operating limits in the particular band.

Q28: ISED is seeking comments on the extent to which technical factors such as ensuring coexistence, managing interference, etc. could impact SMCS coverage.

147. The Department must ensure that any technical regulations and coexistence measures are not overly restrictive, thus preventing Canadians from being able to benefit from SMCS services. In particular, the Department should ensure that no mobile or MSS operator uses spurious claims or hypothetical models based on unrealistic assumptions to unduly slow the commercial deployment of a competitor SMCS service.

Q29: ISED is seeking comments on any other considerations related to the introduction of SMCS in Canada which may not have been specifically addressed in this consultation.

148. Rogers again recommends that the Department should take a technology-neutral approach to SMCS designations for spectrum bands, including not explicitly excluding any commercial mobile spectrum band from SMCS eligibility. We further recommend that the Department designate the 700 MHz Public Safety spectrum as SMCS-eligible and make the relevant CTFA changes as part of the Consultation decision and the SMCS Framework to take effect on April 1, 2025. Such actions will support the forward-looking approach for SMCS services in Canada and reduce future impediments from slowing down the deployment of SMCS services, including those to support the future Canadian Public Safety Broadband Network.
149. As SMCS services rolls out and WSPs and satellite operators can better forecast use case system requirements, various capacity solutions will be required. It is expected that Internet of Things (IoT) in rural areas will become a major driver of the capacity requirements. As such, consideration should be given to future delivery from satellites to HAPS or other ESIM that can distribute cellular connectivity in these defined capacity regions. This should include services that may be offered in current and coming mobile bands, (e.g., 3500 & 3800 MHz, 10-13 GHz, 24-29 GHz, 37-39 GHz, etc.). As the 3500 & 3800 MHz bands were already a FSS satellite band (3700-4200 MHz), no additional international studies should be required, with flexible use licensees and SMCS satellite operators managing coordination issues. Additional coexistence coordination may be required with legacy FSS operators, but we note that one of the major Canadian operators (Telesat) is also exploring LEO constellations. New 3GPP standards related to Integrated Access and Backhaul may be particularly useful in delivering a future SMCS service that employs the use of two blocks of TDD spectrum operating as a pseudo-FDD band. This again recommends that the SMCS Framework take a technology-neutral perspective and does not automatically exclude TDD bands from consideration.
150. We again highlight that there are different potential implementations of how to connect to space services. These are developing and may be non-standardized, as they are not currently expressed in 3GPP. In these cases, the satellite providers are not licensed for their own access spectrum (either MSS or ATC) and, as such, the space vendor will have their own proprietary architectures to which mobile network operators will interconnect. It will take time to iron out these interfaces and move towards standardized solutions, and the SMCS Framework should take this

into account in developing the appropriate regulatory regime. This also includes and is not limited to a number of individual satellites in a constellation launched over specific time frames and their final orbits. As such, the Department should ensure that any SMCS coverage or service requirements take into consideration evolving standards, particularly given the that previous MSS applications that have been challenged to maintain sustainable business models. We believe that a review in ten (10) years of the SMCS framework should be undertaken by ISED to consult on changes to the licensing regime, any coverage requirements and evolving technical architectures.

151. Rogers thanks the Department for the opportunity to share its views and participate in this consultation process.