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Innovation, Science and Economic Development Canada
Engineering, Planning and Standards Branch
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**Re: Consultation on a Policy, Licensing and Technical Framework for
Supplemental Mobile Coverage from Space (SMCS) – Canada
Gazette, Part 1, 29 June 2024, document SMSE-006-24**

The Mobile Satellite Services Association (MSSA)¹ commends Innovation, Science and Economic Development Canada (ISED) for this timely consultation on a policy, licensing and technical framework for the introduction of SMCS in Canada. We appreciate this opportunity to provide our comments.

MSSA is a non-profit industry association that seeks to promote and advance the emerging direct to device (D2D) ecosystem and support the efforts of D2D solutions providers—including terrestrial mobile and satellite operators, original equipment manufacturers (OEMs), infrastructure providers, chip vendors, and others. More specifically, MSSA seeks to advance global mobile connectivity for D2D and internet of things (IoT) services via open, standards-based solutions. MSSA members support a vision of integrating terrestrial and non-terrestrial network (NTN) services to deliver scalable, sustainable and affordable connectivity to any device, anytime, anywhere.

MSSA believes that D2D has the potential to bridge the connectivity gap by complementing the capabilities of existing terrestrial mobile networks and handsets—particularly in unserved and underserved areas (whether urban, suburban, or rural)—while leveraging economies of scale. Critically, though, D2D cannot and should not be viewed as monolithic in nature. To the contrary, two very different approaches to D2D are being contemplated—with very different implications with respect to the risks potentially introduced by D2D operations, and the need for further technical studies and other regulatory measures to ensure that those risks are fully understood and can be

¹ See <https://www.mss-association.org/>.

appropriately managed by ISED. Specifically:

- The first approach (referred to as MSS D2D) uses already allocated and licensed mobile satellite service (MSS) spectrum for D2D and is feasible within the existing regulatory framework. Notably, spectrum in the L- and S-bands has been widely authorized globally for MSS by regulators and the required co-existence and sharing mechanisms have been established. In addition, 3GPP Release 17, 18 and beyond incorporate the MSS L- and S-bands. MSS D2D services can be offered seamlessly in these bands without requiring additional national or international regulatory action.
- The second approach (referred to as IMT D2D) relies on satellite operators transmitting in spectrum allocated to terrestrial mobile services (MS) and licensed to mobile operators. This approach will require significant changes to existing regulatory frameworks in Canada (and globally) to allow for different uses of spectrum than existing allocations support, and careful management to avoid interference into existing spectrum uses.

In the parlance of the International Telecommunication Union (ITU), IMT stands for ‘International Mobile Telecommunications.’ It is the generic term used by the ITU community to designate broadband mobile systems and encompasses IMT-2000, IMT-Advanced, IMT2020 and IMT-2030 collectively, respectively called 3G, 4G, 5G and 6G by the market. The official definitions can be found in Resolution ITU-R 56 “Naming for International Mobile Telecommunications.”² MSSA has opted to use the term “IMT D2D” to refer to the satellite use of terrestrial/mobile spectrum in this consultation instead of the term “MS D2D” so as not to create confusion between the two variants of D2D.

Notably, in paragraph 16 of the consultation document, ISED explicitly acknowledges the distinction between IMT D2D and MSS D2D. More specifically, ISED notes that “ISED’s existing regulatory framework for MSS already supports such D2D operations in spectrum allocated to MSS,” obviating the need for further regulatory action to authorize MSS D2D operations. In stark contrast, ISED felt it necessary to initiate the instant consultation to explore the myriad technical and regulatory issues that would need to be addressed to facilitate IMT D2D operations. Indeed, such issues lie at the heart of the World Radiocommunication Conference 2027 Agenda Item 1.13, the task of which is to consider studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and IMT user equipment to complement

² See International Telecommunication Union Radiocommunication Sector FAQ on International Mobile Telecommunication, <https://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-IMT.pdf>.

terrestrial IMT network coverage, in accordance with Resolution 253 (WRC-23).³ The entire international community is grappling with these matters and studying them on a global basis over the next four years.

In short, the prospect of IMT D2D operations presents complex challenges that have not yet been fully studied or addressed, suggesting a need for ISED to proceed with caution. Among other things, there is a general lack of understanding as to the risks that IMT D2D operations could pose to other operators—including satellite operators generally and MSS operators specifically.

Critically, IMT D2D services provided using MS spectrum and outside of any primary MSS allocation, as is currently being proposed in Canada, must be provided on a non-interference/non-protected basis under ITU Radio Regulation (RR) No. 4.4.⁴ But this can be difficult to enforce in practice. As a result, operations under RR No. 4.4 place other systems and services at a high risk of interference.

This risk is particularly pronounced in the case of low earth orbit (LEO) systems operating under RR No. 4.4. Indeed, the ITU Radio Regulations Board (RRB) has highlighted the specific issues that may arise where LEO systems seek to use RR No. 4.4. As noted by the RRB in a report to the World Radiocommunication Conference 2023 (WRC-23)⁵:

Demonstrating conformity with the Rule of Procedure on No. 4.4 becomes very challenging when thousands of satellites could be involved. It was not clear that administrations and operators fully understood their obligations under No. 4.4 and its impact on the quality of service and capacity of their satellite system. In this context, as the risk of interference was likely increasing, more stringent regulatory provisions would be required to effectively address cases of harmful interference that originated from operations under No. 4.4 and to enforce No. 4.4 with appropriate consequences for non-compliance.

Stated differently, the opportunity for satellite-to-satellite interference is increased when LEO satellite systems offering service in terrestrial MS frequency bands operate

³ See ITU World Radiocommunication Conference 2023 Resolution 813, Agenda for 2027 world radio conference, https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A0000100036PDFE.pdf

⁴ “Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.”

⁵ WRC-23/Document 50 “Report by the Radio Regulations Board to WRC-23 on Resolution 80 (Rev.WRC-07).” <https://www.itu.int/md/R23-WRC23-C-0050/en>.

with hundreds or thousands of satellites.

Reliance by an operator on RR No. 4.4 may also raise questions about long term continuity of its IMT D2D service, which should be of concern to ISED. Under RR No. 4.4, operations must immediately cease if they interfere with other operators. This can adversely impact the consumers that rely on that IMT D2D service, particularly when it is being offered as an emergency communications feature.

In short, the use of terrestrial MS spectrum for D2D implicates technical and operational matters that have yet to be studied or addressed fully. Independent of any regulatory framework for the provision of IMT D2D services that may emerge from the current consultation, ISED should not grant operational approval for any specific IMT D2D systems until a full opportunity has been afforded all potentially affected licence holders (space-based and terrestrial) to confirm the absence of interference to their systems.

With these introductory comments in mind, MSSA hereby offers the following responses to several of the individual questions posed in the consultation document.

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)

For the reasons set forth above, MSSA urges ISED to take a cautious approach to authorizing SMCS operations as a general matter, regardless of frequency band. That said, there is a need for particular caution with respect to potential SMCS operations in the 1850-1915 MHz/1930-1995 MHz band (the PCS band), as proposed in paragraph 40 of the consultation document. Indeed, the potential impact of SMCS operations on that band exemplifies the need for caution with respect to SMCS generally.

Notably, the 1930-1995 MHz downlink used by licensed IMT operators and proposed for SMCS downlink creates potential for interference with the ITU globally harmonized mobile-satellite service (MSS) uplink allocation in the 1980-2010 MHz band – which extends into 2025 MHz in Region 2. The use of the same frequency range for SMCS downlink and MSS uplink may create multiple scenarios in which interference could be experienced by users of both services, degrading service quality. Notably,

existing MSSA member studies show that IMT/SMCS downlink operations would cause harmful interference to MSS uplink operations in the same frequency band.⁶ Allowing such interference to MSS services would be inconsistent with the requirements of RR No. 4.4.

The PCS band is but one example that illustrates the need for careful technical analysis *before* authorizing SMCS operations in any frequency band. MSSA encourages ISED to ensure that the potential introduction of SMCS in Canada avoids interference to current services and allocations.

- Q7** *ISED is seeking comments on its 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.*
- Q8** *ISED is seeking comments on its proposal to enable SMCS on a no-interference, no-protection basis with respect to all radiocommunication services.*

The precise wording of the proposed new footnote to the CTFA is presented at paragraph 60 of the consultation document as follows:

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.*

For MSSA's views on the application of the SMCS framework to individual spectrum bands, see our response to Q5. MSSA reiterates that further regulatory and technical studies are needed prior to moving forward with SMCS generally including those at the ITU. If after these studies are conducted and SMCS is authorized in certain frequency bands, MSSA would support the statement that SMCS be provided on a no-interference, no-protection basis with respect to all radiocommunication services. This statement is fully consistent with—indeed required by—Canada's obligations under ITU

⁶ See Omnispace LLC submission to the Federal Communications Commission, "Assessment of Interference to Authorized S Band Satellite Systems' Uplink Created by SpaceX's Non-conforming Use of the 1990-1995 MHz Band As Satellite Downlink," prepared by RKF Engineering Solutions, LLC August 2024, <https://www.fcc.gov/ecfs/document/1083120851173/1>

RR No. 4.4.

MSSA would also encourage ISED to ensure that in addition to operating on a no-protection, no-interference basis inside of Canada and with the U.S., that any satellites potentially authorized in the future for SMCS, do not cause interference to territories of other administrations operating in accordance with the ITU Radio Regulations.

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.

MSSA strongly supports this proposal. Requiring operators of SMCS (both the terrestrial licensee and the satellite licensee) to assume the onus of mitigating any interference that occurs to licensed in-band and/or adjacent band/block terrestrial operations is a vital prerequisite to effective enforcement of ITU RR No. 4.4. As highlighted above, it is also vital to protect satellite operations operating in accordance with the ITU Radio Regulations in territories of other Administrations including in the Arctic and in maritime areas.

We note, however, that this onus of mitigation must not be limited to interference with terrestrial operations. Under ITU RR No. 4.4, the onus of mitigation must also extend to any interference that occurs to licensed in-band and/or adjacent band/block satellite operations.

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.

MSSA does not object to the establishment of a coexistence/coordination regime between SMCS space stations, provided it is made explicit that any obligation to participate in this regime does not apply to the protection of non-SMCS space stations (including the non-SMCS-related operations of space stations that may support SMCS operations in other contexts). As explained in the introductory section of these comments, non-SMCS space stations are protected under ITU RR No. 4.4 and have no obligation to negotiate coexistence or otherwise coordinate with SMCS space stations. For example, as stated above and in the studies provided to the FCC SCS proceeding, it is not technically possible to coordinate ITU RR compliant MSS uplink and SMCS

downlink operations using the same frequency bands such as 1980-1995 MHz.

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We thank the Department for the opportunity to comment on the issues raised by the consultation and stand ready to engage further with the Department and other stakeholders.

Yours sincerely,



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