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

[AST SpaceMobile, Inc.](#) (“AST SpaceMobile”) (NASDAQ: ASTS), welcomes Canada’s Department of Innovation, Science and Economic Development (“ISED”) timely consultation and is pleased to provide its views on this important topic. AST SpaceMobile is a Midland, Texas based company building the first and only space-based cellular broadband network accessible directly by everyday smartphones, designed for both commercial and government applications. The launch of AST SpaceMobile’s first five satellites, called BlueBird Block 1, took place on September 12<sup>th</sup> from Cape Canaveral, Florida.

The company has received authorization for launch and operations for these Block-1 satellites and has an application pending for the subsequent launches of the remaining satellites that will comprise a 248-satellite constellation to provide global services. The first five commercial satellites, each featuring the largest ever commercial communications arrays to be deployed in low Earth orbit, represent a significant milestone in AST SpaceMobile’s mission to bridge the digital divide and extend cellular broadband service to billions worldwide.

AST SpaceMobile counts several of the world’s largest Mobile Network Operators (“MNO”) as strategic investors, including AT&T, Verizon and Vodafone, and other key institutions such as Google, Rakuten and American Tower. In Canada, Bell is an investor and an MNO partner. Elsewhere, other MNO partners include Orange and Telefonica (Europe and beyond), Telstra (Australia), Millicom/Tigo, Liberty Latin America, SmartFren and Indosat Ooredoo (Indonesia), Globe Wireless Ltd and Smart Communications Inc. (Philippines), Africell (Africa), MTN Group (South Africa), as well as several companies headquartered in the Middle East such as Zain Group (Kuwait), STC (Saudi Arabia), Etisalat (UAE).

Please find attached AST SpaceMobile response to the above noted consultation. AST SpaceMobile strongly believes that protection of its partners MNO services is paramount in these proceedings so would draw the Department’s attention to the Question 22 responses.

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We appreciate having had the opportunity to provide comments to this important consultation.

Sincerely,

/s/ **Vikram Raval**

Vikram Raval

Global Head of Regulatory Affairs

Attachment

Response to Question 1

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

AST SpaceMobile has confirmed Satellite Direct to Mobile capability with its first satellite, called BlueWalker 3, launched 2 years ago. In mid-2023, AST SpaceMobile demonstrated voice and data calls using 2G (voice only), 4G LTE and 5G achieving 3 bps/Hz spectral efficiency to support up to 120 Mbps in a 40 MHz allocation. Since then, the company has invested significantly in a 185,000 square foot state of the art facility in Midland for the assembly, integration and testing of the largest communications arrays to be placed in low earth orbit.

AST SpaceMobile commends ISED for the fast-follow approach initiated by the USA FCC, which will benefit consumers by being early adopters of a regulatory framework to enable Supplemental Mobile Coverage by Satellite (SMCS), or as it is referred to in other jurisdictions Supplemental Coverage from Space (“SCS”), Direct-to-Device (“D2D”), and Satellite Direct to Mobile Services.

ISED will gain invaluable insights as a result of this consultation and by allowing such services to deploy sooner can take this into account for ITU-R WRC-27, which will help guide the Department’s position on Agenda Item 1.13 of that Conference.

AST SpaceMobile encourages ISED to expeditiously review the comments and replies to this consultation and then adopt a supportive policy and technical rules that will allow the rapid deployment of these services. The SMCS technology holds promise for helping to close mobile wireless coverage gaps, including along roads and highways, rural areas and Indigenous communities and even in remote parts of Canada.

Perhaps the optimum benefit of the SMCS deployment is that the Canadians living in unserved or underserved areas will be able to utilize the same wireless devices (smart phones, tablets, etc.) that the individuals of Canadians living in urban and suburban areas take for granted. The SMCS satellites will operate with unmodified devices as it is the satellite network intelligence that allows for such seamless operations between the SMCS satellites and the partner terrestrial network. AST SpaceMobile will maximise the benefits for consumers of SMCS by allowing users to operate their wireless devices not only for texting and messaging – but broadband, with the largest commercial phased array low earth orbit satellites, providing users true 5G capability.

Response to Question 2

*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.*

AST SpaceMobile asserts that the satellite spot beams can be tailored to conform to the MNO SMCS service partner’s licensed area.

AST SpaceMobile believes that ISED should license SMCS in any licensing tier area and in any frequency band held by an SMCS MNO partner, subject to technical conditions that allow for the protection of adjacent areas on the same frequency block or channel held by another entity. It is not necessary that there be collaboration between various MNOs such that the entire Canadian territory be covered on the same frequency. Consequently, AST SpaceMobile believes that the SMCS licenses can be provided on any tier level (1, 2, 3, 4 and 5) where the MNO partner holds licences as long as the area is sufficiently large to allow service at a minimum required PFD level, while not exceeding the PFD limits adopted to protect adjacent areas.

AST SpaceMobile's position is that these areas can be adequately protected through the adoption of appropriate PFD limits at the edge of adjacent service boundary <sup>1</sup>

Response to Question 3

*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.*

AST SpaceMobile believes that “smaller beam sizes would provide higher capacity per user and offer some protection area reduction, depending on the satellite's maximum EIRP”. For example, in bands below 1 GHz, namely in the cellular 800 MHz band, the five Block 1 satellites will use a 35 dBi gain antenna. Subsequent AST satellites will operate at higher altitudes, around 700 km, with a 41 dBi antenna. These subsequent satellites will also have capability to transmit in mid-bands, with a 47 dBi gain antenna. Higher gain antennas allow AST SpaceMobile to tailor the coverage to the intended service areas.

Response to Question 4

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

AST SpaceMobile believes that SMCS can be introduced into any commercial mobile bands, and bands that are used with the same technology, e.g., 700 MHz broadband public safety, as long as there are no other service that would be impacted more by satellite transmissions as opposed to terrestrial deployments.

Response to Question 5

*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)*

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<sup>1</sup> See response to Question 22 subsequent.

AWS-1 (1710-1755 MHz/2110-2155 MHz)  
AWS-3 (1755-1780 MHz/2155-2180 MHz)

AST SpaceMobile supports the adoption of the above frequency bands in the upcoming SMCS policy and to also include the 2305-2320 MHz and 2345-2360 MHz WCS bands for SMCS deployments.

Response to Question 6

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

AST SpaceMobile supports the adoption of the frequency bands listed under question 5 above and proposes to also include the 2305-2320 MHz and 2345-2360 MHz WCS bands for SMCS deployments. There is no known technical reason in Canada to abstain from adding the WCS bands as there are very few radio-astronomy (“RAS”) stations and to the extent that these use portions or all of the WCS spectrum, they can be protected with sufficient geographical separation between any SMCS satellite beam and the RAS observatory. Also, AST SpaceMobile is of the opinion that adjacent band limits can be adopted to protect satellite radio services in the interstitial band, i.e., the 2320-2345 MHz band and Aeronautical telemetry (“AMT”) in the 2360-2400 MHz band. In the same vein, AST SpaceMobile believes that absent issues that cannot be resolved by appropriate technical standards, any commercial band should be allowed to operate with SMCS.

Response to Question 7

*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.*

AST SpaceMobile agrees with the Department that a secondary allocation to the MSS, limited to SMCS use only, is the appropriate way to introduce this new application in one or more footnotes in the Canadian Table of Frequency Allocation. AST SpaceMobile would urge the Department to avoid the use of the terms “no interference, no protection” in any regulatory text, as this expression, while quite acceptable colloquially, has consequences that could be quite severe for the services to which it is applied.

First, there is no such possible use of a band on a truly “no interference” basis; in fact, the ITU Radio Regulations refer to “no harmful interference” in both its definition of “secondary service” and in the formulation of RR 4.4.<sup>2</sup>

Second, while services to which bands are allocated on a secondary basis cannot claim protection (from harmful interference) from stations in primary services, either existing or future, they can claim protection from stations of the same or other secondary services to which the frequency

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<sup>2</sup> See ITU RR 4.4 and 5.28; this is also the case for ISED’s “secondary allocation” definition in Section 1.3 of the Canadian table.

may be assigned at a later date.<sup>3</sup> Stating that SMCS would be allowed under a strict “no interference, no protection” basis would be akin to making SMCS a “tertiary” service.

Third, if the allocation to SMCS was to be qualified as “no interference, no protection” in the regulatory text, it would then have the connotation that these services would not be protected by future secondary allocations that may come many years later and would be required to protect such services after they are introduced. This does not provide the level of certainty required for the massive investments required to deploy SMCS services.

Fourth, the language of Footnote Cxx proposed by ISED would not only make SMCS secondary to primary services in the same bands, but even those across the entire RF spectrum, something that is neither practical, nor desirable. For those services that may require additional considerations, the Department can adopt specific rules or technical standards.<sup>4</sup> The SMCS should not be made to be “secondary”, or worse yet “tertiary” to all allocated services.

For the above reasons, AST SpaceMobile proposes that Footnote Cxx be as follows:

**ADD Cxx:** Additional allocation: The following frequency bands [...to be determined by ISED] are allocated to mobile-satellite service on a secondary basis, limited to the provision of supplemental mobile coverage by satellite (SMCS) only and are subject to the rules of the SMSE-006-24 Decision. If any unwanted emission from a transmitter operating in the SMCS service results in harmful interference to users of another radio service, ISED may require a greater attenuation of the SMCS emission than specified in the SMSE-006-24 Decision. In the bands [... to be determined on a case-by-case basis], SMCS shall not cause harmful interference to stations to which frequencies are already assigned in the same bands allocated on a secondary basis to a radio service.

Note: the “SMSE-006-24 Decision” in the proposed footnote above refers to the decision document that ISED will publish after conclusion of the consultation process.

#### Response to Question 8

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

As per the response to question 7, AST SpaceMobile believes that an allocation *on a no-interference, no-protection basis* now and in the future is untenable and not desired from a service or investment point-of-view. To ensure protection of primary services, this is covered by the very definition of “secondary services”, while the protection of stations already operating in bands allocated to other services on a secondary basis can be achieved through the appropriate rules or technical standards. Furthermore, AST SpaceMobile believes that allowing SMCS on the basis of no interference/no protection “*with respect to all radiocommunication services*” is way too broad and could lead operators of sensitive services to claim protection from SMCS even if

<sup>3</sup> See ITU-RR 5.31 and item (c.) from the Secondary service definition in Section 1.3 of the Canadian table.

<sup>4</sup> For example, the secondary allocation in the band above.

other services with allocations much closer in the spectrum would cause much higher levels of interference. AST SpaceMobile would urge the Department to include only regulatory language that protects those services operating co-frequency and adopt technical measures, such as standards, if protection mechanisms are required in adjacent bands.

AST SpaceMobile views that because RR 5.317, the band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis in Canada, which could result in unintended consequences. Whether ISED enables MSS service on a Secondary or Primary basis (using RR 5.317), AST SpaceMobile recommends that the MSS service should be limited to the provisions governing SMCS in a new or revised Canadian footnote. This recommendation is specific to the band 806-890 MHz and should in no way be interpreted as calling into question the primary status of the mobile satellite service in any other bands.

Response to Question 9

*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.*

AST SpaceMobile believes that SMCS is a viable solution for extending the coverage of terrestrial mobile networks in areas where such deployments are not economically viable. AST SpaceMobile satellites will have sufficient power and capacity to provide services in rural and remote areas with little clutter, for example along roads, highways, train tracks, etc. where the signals should have sufficient margin to allow penetration in vehicles. In many instances there may be sufficient signal strength to allow penetration in home dwellings located in areas that are currently not covered by terrestrial means. This will allow customers of partner MNOs to receive similar services in these areas that their urban counterparts currently enjoy. While the satellite system capacity cannot be compared to the hundreds of base stations deployed across the country, the unserved population is such a small percentage of the overall Canadian population, that the required incremental throughput to be served by satellite is commensurate to the satellite network's capacity. Furthermore, another advantage of SMCS extended coverage is that the beams can be placed anywhere there is demand, even when such demand is sporadic which would not justify the cost of terrestrial infrastructure.

SMCS brings all the benefits of stand-alone MSS with the significant advantages of being integrated into the main terrestrial mobile networks, using the whole panoply of existing and future (unmodified) user devices that are used by MNOs, and leveraging the MNO's infrastructure and billing systems, for a truly seamless experience.

Questions 10 to 15

AST SpaceMobile does not have any comments on these questions at this time and will review the other commenters' suggestions and respond in reply comments, as required.

**Response to Question 16**

*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.*

AST SpaceMobile concurs with the Department's proposals for licensing SMCS systems.

**Response to Question 17**

*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.*

*In providing comments to the above questions, respondents are asked to include supporting rationale and arguments.*

AST SpaceMobile is very confident that its satellite downlink operations in Canadian coastal waters will not cause harmful interference into Government of Canada radiolocation operations in the 890-894 MHz band. The satellite PFD in these waters can be tailored to ensure protection of the radars, or alternatively, the 4 MHz sub-band (channels A' and B') can be avoided in coastal areas, utilizing instead the rest of the cellular band assigned to its MNO partners.

Question 18 to 21 on license terms and fees

AST does not have any comments on these questions at this time, however, may have further views on the detailed proposed conditions of approvals in Annex B and licence conditions contained in Annex C of the consultation after reviewing the record of comments.

Response to Question 22

*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.*

SMCS uplink operations (handset to satellite)

AST SpaceMobile submits that existing technical requirements applicable to mobile user equipment are sufficient to allow operation of SMCS, as the systems are designed to operate with existing devices.

SMCS downlinks impact on adjacent terrestrial mobile service areas

AST recommends that for harmonization with the United States,<sup>5</sup> ISED adopt field strength limits that are the same as the FCC (40 and 47 dBuV/m) to facilitate cross-border protection (per the response to question 27 below).

SMCS downlinks impact on adjacent terrestrial mobile frequency blocks or bands

AST SpaceMobile supports its Canadian and United States MNO partners' positions<sup>6, 7</sup> and thus recommends that the Department adopt a uniform OOB PFD of -120 dBW/m<sup>2</sup> per MHz to the aggregate of all satellites in an operator's SMCS constellation, as the FCC has done in its SCS rules. The risk of relaxing the aggregate PFD limit in a given band is further compounded by the aggregation of OOB from multiple SMCS satellite systems that would be operating across mobile bands, which will degrade the MNOs terrestrial network capacity.

AST SpaceMobile is very conscious of the need to protect its terrestrial MNO partners' spectrum and recognizes that any relaxation in the OOB PFD limit would jeopardize the terrestrial mobile services, especially considering the very considerable reduction in network downlink throughput in major cities and metropolitan areas that AT&T calculated in the United States.<sup>7</sup> AST SpaceMobile firmly believes that in no case should SMCS satellite operations cause unacceptable degradation to mobile capacity.

<sup>5</sup> FCC utilizes field strength limits (40 and 47 dBuV/m) which translates to -116/-109 dBW/m<sup>2</sup> per MHz when using a 10-MHz carrier bandwidth, or -113/-106 dBW/m<sup>2</sup> per MHz for 5 MHz carriers.

<sup>6</sup> Bell in Canada, AT&T and Verizon in the USA.

<sup>7</sup> See AT&T submission to FCC dated August 29<sup>th</sup>, 2024 in Docket GN 23-135

See <https://www.fcc.gov/ecfs/search/search-filings/filing/10829214350725> or [https://www.fcc.gov/ecfs/search/search-filings/results?q=\(proceedings.name:\(%2223-135%22\)\)](https://www.fcc.gov/ecfs/search/search-filings/results?q=(proceedings.name:(%2223-135%22)))

AST SpaceMobile supports the FCC's single aggregate OOB limit for all mobile bands, as this would facilitate cross-border operations, in addition to the reasons previously stated. Moreover, as there are multiple licensing blocks, especially in mid-band, the collective OOB from all SMCS satellite systems could be significantly increased as more satellite operators receive approval, hence the aggregate PFD limit per system should account for that situation.

Response to Question 23

*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.*

Please see the response to Question 22.

Response to Question 24

*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.*

AST SpaceMobile understands that SMCS service would operate on a secondary basis, and that should harmful interference occur to a primary service, or stations of another deployed secondary service, the SMCS satellite operator would be responsible to assume the onus of mitigating any interference into in-band services. This would also extend to potential adjacent band/block terrestrial mobile service, even if the PFD limits are met; if any unwanted emission from a satellite transmitter operating in the SMCS service results in harmful interference to users of another radio service in adjacent bands, ISED may require a greater attenuation of the satellite emission than those prescribed in SMCS decision and technical standards that will be adopted as a result of this consultation.

Response to Question 25

*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.*

AST SpaceMobile confirms that coexistence between SMCS systems can be achieved through inter-system coordination. This will be done in coordination with the local partner MNO who owns the spectrum.

Response to Question 26

***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.*

AST SpaceMobile is actively coordinating its operations with the National Science Foundation in the United States to protect sensitive radio-astronomy sites from satellite interference, and solutions adopted could also be applied in Canada.

Response to Question 27

***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.*

The cross-border agreement would be greatly simplified if the Department adopts domestic rules that align with FCC rules for field strength and PFD limits, as proposed by AST SpaceMobile in response to questions 22 and 23.

Response to Question 28

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

AST does not have any comments on these questions at this time.

Response to Question 29

***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.***  
***In providing comments, respondents are asked to include supporting rationale and arguments.***

AST does not have any comments on these questions at this time.